COMPARISONS AND RELATIONSHIPS OF ORAL AND SILENT READING PERFORMANCES OF GOOD AND POOR COLLEGE FRESHMAN READERS

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To

My Mother and Father,

Rev. and Mrs. L. G. Fields

For Their Interest and Encouragement

Throughout This Endeavor

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INTRODUCTION

Rationale.—Today the significance of oral and silent reading in school and out-of-school activities is realized, and it is generally agreed that the two reading processes have much in common. While silent reading is the individual's means of obtaining thoughts and ideas, oral reading is the medium for transmitting these thoughts and ideas to others. Both are an integral part of any well-balanced reading program. Shane supports this opinion when he says:

> There seems little doubt that professional interest in oral reading has revived during the past decade, after a rather long period when it was given little heed. The recent attention being given oral reading recognizes that it is an important component of the well-balanced language arts program-a basis for further strengthening of reading instruction.[1]

There are many occasions wherein oral reading is warranted in life situations and in school. In out-of-school activities effective reading aloud is important in reading aloud to friends, family or children; reading for appreciation, as in poetry; choral reading; reading announcements and reports; and reading to inform others.

As stated by Smith:

> . . . oral reading in the classroom today . . . is not the glib, word-calling type which we had in the past. Modern oral reading is largely a process of interpreting the meanings of printed context to others in the words of the author. Beyond the primary

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[1]Harold G. Shane, "The Expanding Role of Oral Reading in School and Life Activities," Oral Aspects of Reading, ed. H. M. Robinson, Supplementary Educational Monographs, No. 82 (December, 1955), p. 4.

> grades, oral reading today is considered valuable to the extent that it is used as a means of informing or entertaining an audience.[1]

Oral reading also facilitates many activities which occur in school. Reading poems or stories for the entertainment of classmates, reading selections from favorite books in making reports, reading from a reference to prove a point, reporting upon materials read in the library, and choral reading are among the more important types of oral reading used in schools today.[2]

Even though a definite place is now given to oral reading in the school program and the values of reading aloud in modern education and life are realized, the value, importance and present trends in silent reading cannot be overlooked.

The modern world is a reading world. Never before has the ability to read well been so highly important in elementary school, high school, higher education, and occupational areas as it is today. Therefore, in order to meet the demands of this day and age the ability to read rapidly and comprehensively is vital. Above all else, meaningful reading is accorded primary importance.[3]

Today reading teachers use a variety of methods, techniques, basic and supplementary reading materials. These are all a part of their

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[1]N. B. Smith, "Relative Emphasis on Oral and Silent Reading in the School Program," Oral Aspects of Reading, ed. H. M. Robinson, Supplementary Educational Monographs, No. 82. (December, 1955), p. 73.

[2]Ernest Horn and James F. Curtis, "The Improvement of Oral Reading," The 48th Yearbook of the National Society for the Study of Education, Part II (Chicago: University of Chicago Press, 1949), p. 256.

[3]Paul Witty, Reading in Modern Education (Boston: Houghton Mifflin Co., 1949), p. 6.

efforts to aid students in acquiring those skills necessary for efficient silent reading with increased attention to individual needs and differences. Unquestionably, the heaviest emphasis in the school program as a whole must be on silent reading if we are to prepare children adequately to meet the demands of modern life.[1] Any conclusions arrived at concerning present trends in silent reading would certainly consider these as being significant: (1) increased attention to reading for specific purposes, (2) the need for wide reading, and (3) recognition of individual needs and differences in reading instruction and achievement.

The writer has attempted to show the relative value and place of oral and silent reading in school and out-of-school activities. It is felt, furthermore, that consideration must also be given to the following specific aspects of the two reading processes: (1) specific relationships between oral and silent reading skills in higher education, (2) differences inherent in the two processes, and (3) differences in patterns of the factors in good and poor readers considered in this study. A discussion of these aspects is felt necessary as they guided the writer in the study undertaken.

First, one of the major factors that contributes to success in academic achievement in higher education is the ability to read well. More specifically, college students should possess reading skills and abilities necessary for successful academic achievement. As they progress in their subject areas, rapid and comprehensive reading for main ideas, details, conclusions, inferences, factual information, appre-

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[1]Smith, op. cit., p. 72.

ciation, pleasure and critical reading are required and necessary.

It is realized that the majority of reading engaged in by college students is done silently; however, many occasions demand oral reading. This need may arise in any of the students' curricular experiences, whether in or out of class.

Among those specific reading skills applicable to oral and silent reading of college students are: (1) vocabulary development, (2) comprehension ability, (3) rate of reading, and (4) correct mechanical habits of eye-movements.

"In our highly verbal culture an accurate understanding of the meanings of words is a necessary prerequisite for reading with meaning."[1] Continuous expansion and development of vocabulary skills are required in reading on all educational levels. Moreover, college students should be mature readers, possessing a vast storehouse of words in order to cope successfully with the varied reading purposes and needs expected of them. A large general as well as a specialized vocabulary, such as, mathematics, science, history, philosophy, religion, education, music, and English, is necessary. As stated by Hildreth, ". . . a stock of no fewer than 10,000 words is needed for everyday reading at the average adult literacy level."[2] Certainly college students should be familiar with most words encountered in or out of context, and those which are unfamiliar should be easily acquired through the use of dictionary or

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[1]Albert J. Harris, How to Increase Reading Ability (New York: Longans, Green & Co., 1956), p. 397.

[2]Gertrude Hildreth, Teaching Reading (New York: Henry Holt & Co., 1958), p. 125.

analytical skills. An extensive vocabulary and accuracy in recognizing words enable readers to grasp the meaning of material read. This understanding is necessary for efficient silent and effective oral reading.

In the true sense, comprehension is a major skill without which silent or oral reading cannot take place. Absence of this skill in reading results merely in word calling, and this is not reading. A minimum essential for comprehension in reading is an understanding of the words used by the author.[1] Consequently, comprehension and vocabulary are closely related. A knowledge of words encountered in reading aids in understanding and acquiring meaning from sentences, paragraphs, larger units of materials, and reading for those specific purposes previously mentioned.

Rate of reading and comprehension are so interrelated that it is better to consider this skill as rate of comprehension, since speed without the latter is ineffectual. In today's living there is so much to read that the ability to read quickly has become an important asset. On the college level the ability to read as fast as one can comprehend, grasping the reading materials in large units, is of prime importance. Whether in an oral or silent reading situation, rate of comprehension is dependent upon the particular purpose for reading.

The manner in which the eyes move across the printed page is important in both reading processes. It is realized that the eyes do not move across the printed page in a continuous sweep. Rather, in reading the eyes make a series of rapid movements accompanied by brief pauses.

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[1] Harris, op. cit., p. 397.

Therefore, the photographic recording of eye-movements in reading reveals significant characteristics of the eye-movement habits of readers. The number of pauses or fixations, movements from one fixation to another, return sweeps to successive lines of print, regressive movements to lines previously read, and duration per fixations are revealed through eye-movement photography. These measures of eye-movements in reading give some indications of the reading abilities of students in the oral and silent reading processes.

The second specific aspect for consideration is that of showing the major differences inherent in oral and silent reading. Areas wherein these may be noted are rate of reading and diagnosis.

Oral reading is a slower process than silent because articulation and pronunciation are required; whereas silent reading is characterized by the absence of inner speech. In reading aloud eye-movements are slowed down somewhat in order to keep the eyes from getting too far ahead of the voice. "The eyes can read words approximately four times as fast as the vocal apparatus can pronounce them."[1] Consequently, silent reading, not being characterized by vocalization, is a faster process.

Oral reading is also a valuable aid in diagnosing reading difficulties. Having students read aloud reveals certain kinds of errors which may occur in both processes. Errors such as omissions, additions, insertions, substitutions of words or letters, improper phrasing, and lack of word knowledge can be detected. All of these directly influence oral and silent reading comprehension.

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[1]Luella Cole, The Improvement of Reading (New York: Farrar & Rinehart, Inc., 1938), p. 62.

In view of the previous discussion it is evident that there are distinct differences between oral and silent reading. However, of those specific reading abilities applicable to oral and silent reading previously enumerated and discussed, there may be possible differences in the patterns of these factors of both processes in good and poor readers. Even though a student's general reading level is considered good there may be specific areas in which the reader rates higher than in others. Likewise, a student whose general reading level is poor may rate higher in certain specific skills than in others too.

The foregoing discussion of oral and silent reading as it related to place and value, to certain specific relationships, and to differences, led the writer to ask these questions: (1) How did these relationships and differences influence the reading habits of college freshmen in establishing levels of good and poor reading? (2) What differences, if any, were there between the oral and silent reading of freshmen who took reading and those who did not? The writer hoped that this study would ascertain these general relationships and differences, if any.

Evolution of the Problem.—The writer's experience as a Graduate Assistant in reading in the Clark College reading laboratory from 1958-60 contributed to the evolution of the problem of this study. During this period the writer noted that freshman students who took reading encountered difficulties in oral as well as silent reading. Specific difficulties were noticed in the areas of accuracy, comprehension, and rate of reading. Because of this observed relationship noted between certain aspects of oral and silent reading of those students, the writer conducted this study, utilizing one group of students who took

reading and one who did not, in order to compare and relate their oral and silent reading performances.

Statement of the Problem.--The problem of this study was to compare and relate comprehension, rate and eye-movement patterns in the oral and silent reading performances of selected groups of good and poor readers enrolled in a college freshman class.

Purposes of the Study.--The general purpose of this study was to determine and compare the relationship between oral and silent reading abilities of a group of selected good and poor readers.

Specifically, this study attempted to answer these questions:

1. For the two selected groups of readers what are the levels of achievement in these general and specific areas?
    a. General levels of oral and silent reading
    b. Comprehension in oral reading
    c. Comprehension in silent reading
    d. Rate of oral reading
    e. Rate of silent reading
    f. Eye-movement patterns in silent reading
2. How do the two groups compare in the respective components of silent and oral reading?
3. Within each of the two groups what is the relationship between the oral and silent reading components and patterns just enumerated?
4. What are the differences between these respective relationships found within the groups?
5. What educational implications can be drawn from the findings?

Limitations of the Study.--This study was limited to two groups of twenty Clark College freshman students-one group who took reading and

the other who did not. The group who took reading received systematic training in the improvement of basic reading skills for one academic semester. In addition, the analysis of the relationship inherent in the oral and silent reading abilities of the two groups was restricted to their performances on standardized tests and observations of eye-movement patterns in silent reading. The fact that the comparison of oral and silent reading performances was limited to certain specific aspects of the two processes; namely, accuracy as it related to the readers' ability to pronounce words correctly, rate, comprehension, and eye-movement patterns in silent reading, constituted another limitation of this study. At the time of this study the Reading Eye which was used in photographing and interpreting the eye-movement patterns of the two groups had not been standardized; however, standardization procedures were under way and did include the eye-movement patterns of some students from the Atlanta University Center. This study was further limited in this respect by the fact that the selections read by the subjects during the photographing of their eye-movements were brief.

Definition of Terms.--The following terms used in this study carried these designated meanings:

1. "Good Readers," as used in this study, referred to those students whose general reading ability was above the eleventh grade level as measured by the Iowa Silent Reading Test.

2. "Poor Readers," as used in this study, referred to those students whose general reading ability was below the ninth grade level as measured by the Iowa Silent Reading Test.

3. "Accuracy," as used in this study, referred to the extent to which the readers could pronounce words correctly with the absence of such errors as: repetitions, word by word reading, omissions, substitutions and insertions of words and/or letters.

4. "Comprehension," as used in this study, referred to the readers ability to understand and acquire meaning from materials read in terms of responding to specific questions relative to the readings.

5. "Rate" or "Rate of Reading," as used in this study, referred to the particular speed at which the readers read with a certain degree of comprehension.

6. "Eye-movement Patterns," as used in this study, referred to the kinds of movements the eyes made across the printed page during the reading process.

Method of Research.--The descriptive survey method of research, utilizing the special techniques of testing, statistical treatment, and analytical interpretation was used to collect and interpret the data for this study.

Description of the Subjects.--Forty freshman students enrolled at Clark College during the second semester of the 1959-60 academic year participated in this study. These students were selected on the basis of their performances on the Iowa Silent Reading Test, Form Am, administered as a part of the freshman placement tests. Using these test scores, the writer divided the students into two groups-those who scored at and above the eleventh grade reading level and those who scored below the ninth grade reading level. From these two groups, the forty students for this study were selected by random sampling. Therefore, the selected group of twenty good readers consisted of those students whose general reading ability was at and above the eleventh grade reading level; and the group of twenty poor readers was comprised of students whose general reading ability was below the ninth grade reading level as measured by the Iowa test.

The students in both groups came from and attended schools in Alabama, Florida and Georgia. Most of them attended schools in urban areas, while some went to schools in rural areas.

The group of poor readers used in this study received systematic training in the improvement of basic and specific reading skills for one semester at Clark College; whereas, the group of good readers received no such training through a reading improvement course. In spite of this fact, both groups were exposed to significant reading experiences in English classes and other subject areas during the freshman year. Experiences such as reading for main ideas, details, factual information, conclusions, vocabulary development, critical reading, etc., were common to both groups.

Description of Instruments.--The following instruments were used to gather the data for this study:

1. The Iowa Silent Reading Test, Forms Am and Bm, New Edition
2. The Gilmore Oral Reading Test, Form A
3. The Reading Eye

The Iowa Silent Reading Test was used to establish the levels of good and poor readers and as a basis for analyzing the silent reading habits of the selected subjects for this study. This test is designed to measure the proficiency of high school and college students in doing silent reading of the work-study type.[1] Rate of reading at a controlled level of comprehension; comprehension of words, poetry, sentences,

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[1]H. A. Greene, A. N. Jorgensen, and V. H. Kelley, Iowa Silent Reading Tests, New Edition, Advanced Test: Manual of Directions (New York: World Book Co., 1943), p. 1.

paragraphs, and longer articles; and ability to use skills required in locating information are the three major aspects of silent reading ability that the Iowa test measures. In view of this, the series of tests were constructed and validated, as outlined in the manual of directions, in order to determine whether or not students possessed the reading skills required in study type situations.[1] Correlations with a composite score of all the tests were found to be: Iowa Silent Reading Tests and the Shank Tests of Reading Comprehension, both .86; Nelson-Denny Reading Test, vocabulary unit, .94; and the Minnesota Reading Examination .84.[2]

In order to determine the reliability of the tests the scores on the odd-numbered items were correlated with the scores on the even-numbered items of a test.[3] Based upon the Kuder-Richardson formula for the theory of the estimation of test reliability, "r"$_{tt}$ was found to be .949 and standard deviation 15.8 on the basis of 2,074 students tested.[4]

The Gilmore Oral Reading Test was used to establish the general levels of oral reading and to analyze the oral reading performances of the subjects in this study. Of the two equivalent forms A and B, form A was used. Each test consists of:

> . . . ten carefully constructed oral reading paragraphs which form a continuous story, and an illustration of characters and events in the paragraphs . . . . Five comprehension questions accompany each paragraph. The errors made in reading the paragraphs, the time required for reading each paragraph, and the responses to the

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[1] Ibid., pp. 1-3.

[2] Francis O. Triggs, Remedial Reading (Minneapolis: The University of Minnesota Press, 1943), p. 139.

[3] H. A. Greene, et. al., op. cit., pp. 4-5.

[4] Ibid.

> comprehension questions are recorded, at the time of each testing, in an individual Record Blank for each pupil.[1]

In order to obtain statistical evidence of the validity of this test, Pearson product-moment correlations were computed between the scores made by a group of 24 pupils of the same age in grade 5.[2] The results reported were:

> A Pearson "r" of .77 . . . between the Gilmore test and the Standardized Oral Reading Paragraphs by Gray in the area of accuracy and .45 correlation in rate of the two tests. A correlation of .80 was obtained between the Gilmore test and the oral reading test from the Durrell Analysis of Reading Difficulties in the area of accuracy, a .59 correlation in comprehension and a .50 correlation in rate.[3]

The Reading Eye which was used in photographing and interpreting the eye-movement patterns of the two groups is the latest mechanical development in the field of eye-movement photography and includes the latest mechanical improvements in the area. "The test selections are in the form of 3½ x 5" cards with the test selections printed on one side and ten true-false questions on the other side."[4] The selections are for grades 1-3 and above grade 4. Those above grade 4 contain 115-120 words.[5] The subject area of the selections for high school, college, and adult levels is biography.[6] The test selections for each grade level

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[1] John V. Gilmore, Gilmore Oral Reading Test, Manual of Directions (New York: World Book Co., 1952), p. 1.

[2] Ibid., p. 5.

[3] Ibid., p. 5.

[4] Stanford E. Taylor, Eye-Movement Photography With the Reading Eye, (New York: Educational Laboratories, Inc., 1959), p. 16.

[5] Ibid., p. 16.

[6] Ibid., p. 16.

were carefully prepared in terms of readability, student interest, and appropriateness and consistency of these factors throughout each level.[1] Therefore, on the basis of these factors:

> . . . readability was controlled through such factors as percentage and distribution of grade level words throughout a selection, sentence length and structure, and through a control of content with regard to subject areas . . . and general plot complexity . . . .[2]

Likewise, in order to determine the degree of comprehension:

> The comprehension check questions which are administered orally following the photography of eye-movement patterns are designed to provide a general indication of comprehension to determine whether or not the subject was reading.[3]

Design of the Study.—The following steps characterized the design of this study:

1. Permission to conduct this study was requested and granted from the president, dean and registrar of Clark College.
2. Literature pertinent to this study was reviewed and summarized.
3. The Iowa Silent Reading Test was used to establish the groups on the basis of levels of good and poor silent reading and to analyze their specific silent reading abilities as designated by the purposes of this study.
4. The Gilmore Oral Reading Test was administered to the two groups of students in order to establish the levels of good and poor oral reading and to analyze their specific oral reading abilities as designated by the purposes of this study.
5. The eye-movement patterns in silent reading were photographed and interpreted through the use of the Reading Eye.
6. The data derived from the instruments were assembled into appropriate tables and figures as determined by the purposes of this study.

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[1] Ibid., p. 16.

[2] Ibid., p. 17.

[3] Ibid., p. 17.

7. The data set forth in the tables were statistically treated through the computation of these measures: range, mean, median, standard deviation, standard error, and the Pearson Product-moment Coefficient of Correlation.

8. Fisher's "t" scores were used for computing the differences between the respective relationships of the two groups.

9. The .05 level of confidence was used to analyze and interpret the statistical findings.

10. Conclusions and recommendations were drawn.

Survey of Related Literature.—The literature reviewed in connection with this study revealed that, in general, authorities agree that there is a positive relationship between oral and silent reading; however, there is much diversity among them as to the extent of this relationship. The following areas were reviewed and include: (1) the place and value of oral and silent reading in the school program, (2) studies of good and poor readers, (3) investigations of rate of reading in both processes, (4) eye-movement patterns in reading, and (5) comprehension in silent and oral reading.

Place and Value of Oral and Silent Reading in the School Program.—The literature reviewed relative to this aspect of the two processes revealed that differences of opinions concerning oral and silent reading in the school program have been evident since colonial times. From colonial times up to the present day at least three significant changes in the emphasis placed upon oral and silent reading have occurred. They are:

1. The pre-eminence of oral reading in early reading instruction

2. The period of sole attention to non-oral reading in the school program.

3. Integration of oral and silent reading in the school program

Two factors which appear to account for the importance placed upon oral reading prior to 1900 are use of the alphabet method in basic reading instruction, and the influence of social needs of communities upon the school curriculum. "The Alphabet method . . . was the first approach used in this country to teach boys and girls to read."[1] Memorization of the letters in the alphabet, capital and small, characterized the first step of this method in teaching reading. Through the use of this method extension and growth in reading was facilitated by constant practice in reading aloud. Consequently, the reading process was a slow and laborious task.

Much illiteracy prevailed throughout communities during the early colonial days. Schools were few and facilities inadequate. Since education is a social act with schools being used to further social ends, the school curriculum must foster the kinds of learning experiences among pupils which communities and those in control of the schools consider essential. Therefore, instruction in reading was geared toward meeting the social needs of communities. According to Gray, "In early colonial days, oral reading served a geniune social need. During evenings and on Sundays, those who could not read met in small groups to listen to the reading of the scriptures."[2]

Revolutionary changes in all life activities which occurred at the beginning of the twentieth century had an effect upon the school and its curriculum. Changes which occurred in methods of teaching school subjects had their effects upon reading instruction also. Educators came to realize

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[1]Witty, op. cit., p. 5.

[2]Gray, op. cit., p. 5.

that, while the emphasis placed upon oral reading in school did aid pupils in associating printed words with spoken words, increased appreciation for reading, and aided teachers in evaluating pupil progress in reading, they were lacking in comprehension ability. Failure in understanding and obtaining meaning from material read was brought to the forefront. Gray gives evidence of this in saying that:

> By 1915 widespread protest developed against formal practices in teaching reading that had prevailed. It took the form of a radical shift in emphasis from oral to silent reading, owing in part to the greater economy and efficiency of silent reading.[1]

Many schools completely neglected attention to the oral aspects of reading in this new emphasis upon silent reading. Sole attention to the development of efficient silent reading habits had ill effects. Poor spelling, inaccurate word recognition techniques and little or no training in speech and diction were noted among readers.

As a result of the fallacies revealed in adhering to one particular reading process in the instructional program, authorities and educators came to see that attention should be given to both reading processes. Even though a definite place is now given to oral reading in the school program there is still much diversity among authorities as to the exact function of oral reading in present-day education. Articles written by various authorities on the place of oral reading in the reading process have revealed numerous criticisms advanced against the use of oral reading in the school program. Two criticisms given by Karp are that encountering new words requires one to bring oral reading to an abrupt

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[1] Ibid., p. 6.

stop, and excessive emphasis on oral reading may have negative effects on reading speed.[1] Spache has presented significant information relative to the unsoundness of using oral reading in certain content areas. As stated by him:

> Oral reading used at the upper grade levels to promote comprehension in such fields as science and social studies is unsound on two accounts according to considerable research: (1) It is detrimental to the promotion of good comprehension as a result of silent reading which is the ultimate aim of most reading instruction. (2) It is clearly established that for the average child who has been exposed to silent reading instruction, comprehension is better when reading silently. We cannot expect the individual who reads aloud to show a high degree of comprehension.[2]

In reading orally, posture, voice, pronunciation, enunciation, volume of tone, rate of reading and expression must be taken into consideration.[3] Except for rate of reading and posture, these factors do not enter into silent reading. Moreover, students can be taught best to read for specific purposes: main ideas, details, etc., silently.[4]

Buswell and other authorities in the field conceive reading as being essentially a process of comprehension rather than speed. Therefore, in defense of silent reading, he states:

> When the reading rate is slower than the rate of comprehension, the mind is free to carry on an independent line of thought while the individual is reading, which results in mind wandering. This is particularly observable in oral reading, for a person can read

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[1] Edward Thomas, "Oral Reading in the Total Reading Process," Elementary School Journal, LVIII (October, 1957), p. 36.

[2] Goerge D. Spache, "Teaching Reading," Journal of Education, CVIII (1955-56), p. 27.

[3] Mary Karp, "Silent Before Oral Reading," Elementary School Journal, XLIV (October, 1943), p. 103.

[4] Ibid., p. 104.

> aloud with all the semblance of complete understanding, as far as the listener is concerned, although the reader's mind may be on something entirely foreign to what he is reading.[1]

The ability to pronounce words aloud in reading is still advanced and adhered to in some schools as evidence that the reader understands what he reads. However, research indicates that a rate of silent reading beyond three hundred words per minute is possible with readers who can free themselves of the habit of inner speech or word by word consciousness when reading.[2]

In spite of the criticisms advanced against the relative emphasis upon oral reading in the school program, many authorities agree that its values do warrant a place for it in the school program. A major advantage of oral reading is its effect upon the development of word perception ability.[3] Price and Stroud contend that there seems to be no plausible reason why good instruction given simultaneously in both oral and silent reading should not have a mutually beneficient effect.[4] They feel that the opinions of those who are not in favor of oral reading in the school program have not been subjected to thorough investigation.

As stated by them:

> . . . inspection of more than 1200 published investigations on reading and dozens of books on reading in which statements are found concerning the ill effects of oral reading has failed to reveal a

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[1] G. T. Buswell, "Non-Oral Reading," Education Digest, XI (December, 1945), p. 17.

[2] Ibid., p. 18.

[3] Thomas, op. cit., p. 41.

[4] Helen Price and J. B. Stroud, "A Note on Oral Reading," Education Digest, XI (December, 1945), p. 21.

> single instance in which those statements are supported by experimental evidence.[1]

However, in spite of these two investigators' statements in defense of oral reading they do believe that it is logical to assume that each habit may have some interfering and facilitating effects on the other, and to verbalize implicitly or otherwise is an impediment.[2]

Although it is realized that the reading demands of today call for a heavy preponderance of silent reading among college students and adults, many situations in and out of class warrant the use of oral reading. Certain types of literature, such as poetry, should be read orally and listened to for satisfaction and appreciation. Moreover, there are situations, i.e., reading the minutes of a meeting, making announcements, giving reports and addresses, in which oral reading is required. Nila B. Smith speaks to this point in an able fashion by saying that:

> . . . many factors enter into a determination of the relative emphasis on oral or silent reading . . . . Whether silent or oral reading is used depends upon the classroom activities and needs of the individuals . . . .[3]

Studies Pertaining to General Levels of Good and Poor Readers.--A very limited number of studies concerning general levels of good and poor reading were found by the writer in the literature surveyed. However, those which are applicable and have some bearing upon this study are cited here.

Schubert, in his comparison of best and poorest classroom readers concluded that, "A multiplicity of factors is at work and is responsible

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[1] Ibid., p. 20.

[2] Ibid., pp. 21-22.

[3] Nila B. Smith, op. cit., p. 76.

for a child's being rated as the best or poorest reader. . . ."[1] Whereas, Buswell states that, ". . . superior readers are those who have learned to read without the restrictions of sub-vocalization."[2]

Preston and Tuft, conceiving efficient reading as being the ability to read rapidly with rhythmic continuous eye-movements, conducted a study on the reading habits of superior college students in which their purpose was to determine to what extent a group of college students with superior scholarship ratings possessed efficient reading habits.[3] The subjects and instruments used were twenty-two college students of junior classification, the Iowa Silent Reading Test and the Opthalomograph.[4] They drew the following significant conclusions on the basis of their findings:

1. The evidence did not support the view that successful college students are uniformly efficient readers because less than half of the group read faster than three hundred twenty-five words per minute, one-half to two-thirds exceeded college norms in span of recognition, one-half were free of excessive regressive movements and three-fourths exceeded college norms in comprehension.

2. The distribution of the subjects according to their eye-movements while reading showed a widespread of practice centering somewhat above norms established for college students. Correlations between various measures of reading efficiency were

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[1]D. B. Schubert, "Comparison Between Best and Poorest Classroom Readers," Elementary English Journal, XXXIII (March, 1956), p. 162.

[2]Buswell, op. cit., p. 19.

[3]R. C. Preston and E. N. Tuft, "Reading Habits of Superior College Students," Journal of Experimental Education, XVI (March, 1948), p. 196.

[4]Ibid., p. 196.

low (.00 to .58, with a median of 10.5).[1]

Bliesmer, in a study of the reading abilities of bright and dull children of comparable mental ages found that:

> Bright children are significantly superior to dull children of comparable mental ages with respect to total reading comprehension and the following specific abilities: locating or recognizing factual details, recognizing main ideas, and drawing inferences and conclusions.[2]

He also found that reading rates of bright and dull children of comparable mental ages were approximately the same when comparable degrees of understanding of material read were attained with a wide range of rate being found in both groups.[3]

Rate of Reading in Oral and Silent Reading.--The change of emphasis from intensive reading to extensive reading in American classrooms has made it necessary for students to learn to read rapidly and at the same time to maintain a high level of comprehension. Consequently, question of the relationship of reading rate to the total reading act, whether silently or orally, is certainly due attention.

Laycock, conducted a study of the significant characteristics of college students with varying flexibility in reading rate. The subjects were taken from three hundred ninety-one applicants for admission to a

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[1] Ibid., p. 201.

[2] Emery P. Bliesmer, "Reading Abilities of Bright and Dull Children of Comparable Mental Ages," Journal of Educational Psychology, XLV (October, 1954), pp. 321-25.

[3] Ibid., p. 331.

cosmopolitan university during World War II.[1] They were selected on the basis of those who could read quickly when asked to and those who could not.[2] He found that good readers shift readily from one reading situation to another, poor readers have trouble.[3] On the basis of his findings he concluded:

1. Most people maintain a constant rate regardless of its efficiency.

2. In a group of readers whose comprehension and average reading rate are good, some will be more flexible in reading rate than others. . . .

3. In so far as rate is concerned the more flexible reader is merely one who can jump from one reading situation to another and read in each at a faster or slower rate than usual, depending on comprehension and significance. The less flexible reader does all his reading at most nearly the same rate.[4]

Carrilla and Sheldon stated that, "Speed is one of the aspects of reading in which students feel most limited."[5] They further contend that:

> The aim of reading should be to further understanding, and the amount of time required for this understanding should vary with the purpose of the reader and the difficulty level of the material read . . . . Many students, even at the college level, read with

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[1]Frank Laycock, "Significant Characteristics of College Students With Varying Flexibility in Reading Rate," Journal of Experimental Education, XXIII (June, 1955), p. 331.

[2]Ibid., p. 312.

[3]Ibid., p. 312.

[4]Ibid., p. 312.

[5]L. W. Carrilla and W. D. Sheldon, "The Flexibility of Reading Rate," Journal of Educational Psychology, XLIII (May, 1952), p. 295.

what amounts to one inflexible rate.[1]

In the study previously cited by Preston and Tuft, they found that the students used in their study read, in general, on an average of between three hundred and three hundred-fifty words per minute with approximately one-fifth of them reading above four hundred words per minute and one-fifth below two hundred-fifty words per minute.[2] They also emphasized the fact that one should not readily assume that the reading speeds of superior students possess common characteristics.[3]

Simpson, in her article on reading rate and its relationship to good reading, sheds considerable light upon this aspect of reading as it relates to the perceptual processes. As stated by her:

1. Reading rate depends on several factors: intelligence, visual skills, comprehension and personality.

2. Although word recognition, word meanings, and comprehension skills need to be taught at more advanced levels, a large percentage of the cases of older people have been poor readers due to inadequate reading rate techniques. Then too, there are many cases whose reading rates are poor because of inadequate vocabulary and comprehension.

3. The eye is capable of extremely rapid perception and recognition. The eye is also capable of recognizing a complete pattern in one act-that is, without assembling the parts.

4. Good silent reading should be carried on at a rate that is at least two times faster than oral reading.[4]

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[1] Ibid., p. 296.

[2] Preston and Tuft, op. cit., p. 201.

[3] Ibid., p. 201.

[4] Elizabeth A. Simpson, "Reading Rate and Its Relationship to Good Reading," Education, LXX No. IX (May, 1950), pp. 565-69.

Eurich, in a study of the relation of speed of reading to comprehension, revealed some significant information relative to the relationship between rate of reading and comprehension. Using a group of forty-four college juniors and the Minnesota Reading Examination, he secured three scores for each form used: (1) score on the objective examination before reading, (2) time required for reading, and (3) score on the objective examination after reading.[1] On Form A, ". . . the correlation between rate of reading and the score before reading was .35 ± .09."[2] On Form B, ". . . this coefficient was .39 ± .09."[3] "The relation of the score on the examination after reading and the reading time were expressed by the coefficient .16 ± .10 for Form A and .34 ± .09 for Form B."[4] "A correlation of .47 ± .06 was obtained as indicative of the relation between Form A of the Minnesota Reading Examination for College students."[5] "For Form B of the speed test the correlation was .48 ± .06."[6] He concluded that:

1. The relation between speed and comprehension is dependent upon the manner in which each is measured.
2. There is a positive relationship between rate of reading and comprehension.[7]

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[1]Alvin C. Eurich, "The Relation of Speed of Reading to Comprehension," School and Society, XXXIII (1930), p. 405.

[2]Ibid., p. 406.

[3]Ibid., p. 406.

[4]Ibid., p. 406.

[5]Ibid., p. 406.

[6]Ibid., p. 406.

[7]Ibid., p. 406.

Bloomers and Lindquist, in considering the factors which rate of reading depend upon, also state that:

> The rate at which an individual reads depends upon a wide variety of factors. It depends . . . upon certain characteristics of the reader-upon his reading skills and habits, his experimental background, his physical, mental, and emotional status, acuity of vision, etc.[1]

Studies Relative to Eye-Movement Patterns.--The significant research findings concerning this aspect of the reading process as surveyed by the writer are presented here:

Simpson conducted a study to determine the relationship of certain functions to eye-movement habits of good and poor freshman students at Carnegie Institute of Technology.[2] The data from the test and the records collected for the study consisted of the average number of eye fixations and rate of reading as measured by the eye-movement camera and the Iowa Silent Reading Test.[3] She found that:

> . . . the eye-movement habits of good students and those who rate highest in mental ability to be, in general, definitely better than the eye-movement habits of poor students and those who rate lowest in mental ability.[4]

Likewise, Anderson and Dearborn, in considering individual differences in measures of the eye-movements in reading, state that:

> Good readers at any level make fewer fixations per line, fewer regressions, and take less time per fixations than poor readers . . . . The record of the good reader reveals a regularity

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[1]P. Bloomers and E. F. Lindquist, "Role of Comprehension of Reading," Journal of Educational Psychology, XXXIII (May, 1942), p. 377.

[2]R. G. Simpson, "The Relationship of Certain Functions to Eye-Movement Habits," Journal of Educational Psychology, XXXIII (May, 1942), p. 377.

[3]Ibid., p. 376.

[4]Ibid., p. 375.

> of pattern along the line as well as considerable repetition of pattern from line to line. The record of the poor reader discloses no such uniformity.[1]

In another study of some freshman students at the University of Iowa Simpson found ". . . a Pearson Product-moment correlation between rate of reading as measured by the eye-movement camera and the average number of eye fixations per line to be -.80."[2] "A correlation of -.48 was also found between rate of reading as determined by the Iowa Silent Reading Test and the number of eye fixations."[3] Her studies also support the fact that the purpose for which the person reads has much to do with the character of the eye-movement habits.

Tinker gave significant information in his report on time relations for eye-movement measures in reading. In this study he co-ordinated the eye-movement data of his previous studies in order to bring out the relation of eye-movement time to pause duration. He enumerated and explained them thusly:

1. Fixational pauses and the interfixation or saccadic eye-movements are two important aspects of oculomotor behavior in reading. Reading time consists of the time taken for fixational pauses plus that of saccadic movements, with the pauses being relatively long in duration in comparison with movement.

2. The characteristics of saccadic eye-movements are essentially the same whether they are interfixation movements in reading or other excursions from one fixation to another in the visual field.

3. There are significant individual differences in speed of saccadic movements.

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[1] I. H. Anderson and W. F. Dearborn, The Psychology of Teaching Reading (New York: The Ronald Press Co., 1952), pp. 128-30.

[2] R. G. Simpson, op. cit., p. 377.

[3] Ibid., p. 378.

4. In general, saccadic movements to the right along a line of print extend over a visual angle of from one to four degrees and take from about ten to twenty-three milliseconds respectively.

5. Return sweeps on the average cover about twelve to twenty degrees and take forty to fifty-four milliseconds.

6. The portion of the reading time taken by the eye-movements varies with the comprehension demands of the reading situation. In general, the more careful and analytical the reading, the smaller the relative time taken by the eye-movements.

7. Shifting from silent to oral reading decreases the portion of reading time taken by movements.

8. In studying the eye-movements of good readers, Walker found that ten percent of the reading time was devoted to moves and ninety percent to pauses.

9. In no reading situation yet studied is the movement time greater than ten percent of the reading time.[1]

An analytical study of eye-movement patterns of a group of eighth grade pupils conducted by Seibert led him to conclude that, ". . . there is little relationship between comprehension scores and eye-movement measures."[2]

Bayle, in a study of the nature and causes of regressive movements in reading using a group of good ninth and tenth grade readers at the University of Chicago High School found that:

> Regressions-movements of the eyes backward rather than forward occur when: (1) some factor interrupts the flow of thought during reading as well as when perception is inadequate; (2) failure to recognize the basic meaning of a word interrupts the

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[1]Miles A. Tinker, "Time Relations for Eye-Movement Measures," Journal of Educational Psychology, XXXVIII, No. 1 (January, 1947), pp. 1-9.

[2]Evalyn Bayle, "The Nature and Causes of Regressive Movements in Reading," Journal of Experimental Education, XI (September, 1942), p. 35.

> continuity of thought processes during reading causing regressions; and, (3) failure to combine and relate the meaning of a word properly with the other words appears to cause regressions.[1]

She concluded that, ". . . the number of regressions is dependent upon the success of the interpretation resulting from them."[2]

Buswell, another authority in the experimental study of reading, has done considerable research relative to eye-movements in reading. In his study of the characteristics of the eye-voice span he found it to be longest at the beginning and shortest at the end of sentences.[3] On the basis of measurements of fifty-four subjects he reported that, ". . . there were average spans of 15.9, 13.4 and 10.9 letter spaces for the beginning, middle, and end of sentences, respectively."[4] He further stated that:

> Poor readers pay less attention to the thought of the sentence than do good readers. The poor reader tends to read words one by one as he encounters them . . . . In that case the reader may pass from sentence to sentence without a marked change in the eye-voice span.[5]

Whereas, Anderson and Dearborn state that, ". . . the eye-voice span varies with the individual. . . . Good readers have a wider and more elastic span than poor readers."[6]

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[1]Evalyn Bayle, "The Nature and Causes of Regressive Movements in Reading," Journal of Experimental Education, XI (September, 1942), p. 35.

[2]Ibid., p. 35.

[3]Supplementary Educational Monographs, No. 17, "cited by" I. H. Anderson and W. F. Dearborn, The Psychology of Teaching Reading (New York: The Ronald Press Co., 1952), p. 124.

[4]Ibid., p. 124.

[5]Ibid., p. 124.

[6]I. H. Anderson and W. F. Dearborn, op. cit., p. 125.

Comprehension in Silent and Oral Reading.--The continuous development toward greater reading proficiency is a process with many phases, the goal of which is the comprehension of ideas. Since this reading ability is such an integral part of the entire reading process, oral and/or silent, the research findings cited under studies of good and poor readers, rate of reading, and eye-movement patterns give implications or indications of comprehension abilities as it related to these and any other aspects of the reading processes. However, some significant facts relative to this all important reading ability are presented here.

A sight vocabulary, word recognition skills, concepts, and verbal facility all promote the understanding of the meanings represented by the printed symbols in words, sentences, and paragraphs. The degree to which these meanings are accurately and clearly understood and interpreted by the reader represents the degree to which he is a good reader.[1] Therefore, ". . . there can be no such thing as reading without understanding."[2] However, as stated by Tinker:

> The degree of comprehension is conditioned by such factors as proficiency in reading mechanics, facility in language usage, intellectual capacity, clearness and extensiveness of verbal concepts, background of reading experience, and purpose for which the reading is done.[3]

In like manner, Cole states in her discussion of the degree of comprehension and factors related to it that:

> If a pupil's eye-movements function correctly, if he recognizes the meanings of separate words and phrases, if he remembers what he

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[1]Miles A. Tinker, Teaching Elementary Reading, p. 172.

[2]Ibid., p. 172.

[3]Ibid., p. 175.

> reads in successive paragraphs, if he has the necessary background to attend to his reading, he will achieve an adequate degree of comprehension. If anything goes wrong with a single contributing element, the level of comprehension is at once lowered; if there are several defects there will be little or no understanding of what is read.[1]

Dolch, in an article on complete reading versus partial reading, said:

> In reading one must recognize every word by sight, or know enough phonics to sound it out, or know enough to guess it correctly from context or familiar parts; and, if the reader cannot get every word, he cannot get the author's full meaning.[2] Thus, complete reading is not being carried on.

In a study previously cited by Laycock, he found that, "In going from details to general ideas in reading, poor readers drop in comprehension while good ones maintain their efficiency."[3] While, Reed and Pepper found in their study of the interrelationship of vocabulary, comprehension, and rate among disabled readers that, ". . . comprehension scores are closely related to vocabulary scores. . . ."[4] It is also felt by Triggs that, ". . . if new words are encountered in the material read the students must master them before they can read with comprehension."[5]

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[1]Luella Cole, The Improvement of Reading, (New York: Farrar & Rinehart, Inc., 1938), p. 195.

[2]E. W. Dolch, "Complete Reading vs. Partial Reading," Elementary English Journal, XXXIII (January, 1956), p. 11.

[3]Laycock, op. cit., p. 311.

[4]J. C. Reed and R. S. Pepper, "Interrelationship of Vocabulary, Comprehension and Rate Among Disabled Readers," Journal of Experimental Education, XXV (June, 1957), p. 337.

[5]F. O. Triggs, "Reading at the College Level," Journal of Higher Education, XX (February, 1949), p. 6.

As a result of the facts presented relative to comprehension it is evident that degree and rate of comprehension vary from person to person and in many instances the amount of comprehension a student can demonstrate is a function of the instrument used.

Summary of Related Literature.--The research findings and opinions of noted authorities in the field of reading presented in this chapter included information concerning the place and value of oral and silent reading in the school program, studies of good and poor readers, rate of reading, eye-movement patterns in reading, and comprehension in reading.

The literature surveyed relative to the place and value of oral and silent reading in the school program revealed that there has been much diversity among authorities as to the amount of emphasis which should be placed upon both reading processes in the school program since colonial times. Even though authorities have advanced numerous criticisms against too much emphasis upon oral reading in the school program, many of them do agree that the values of oral reading do warrant a place for it in the school program today. It is further agreed by most authorities that although the heaviest emphasis should be placed upon silent reading in the school program, over emphasis upon any one process may have detrimental effects upon the reader.

The research findings pertaining to good and poor readers indicated that many factors are responsible for a reader's being rated good or poor, and evidence appears to indicate that good readers are not uniformly efficient in all reading skills. Likewise, poor readers do not appear to rate the same in all reading skills.

It was also revealed in the literature surveyed that the rate at which one reads depends upon a variety of factors. The purpose for which one reads and the type of material read have much to do with rate of reading. Research findings further indicated that students, whether good or poor readers, may be found to vary considerably in reading rates; and, in many instances, most people maintain a constant rate regardless of its efficiency.

The manner in which the eyes move across the printed page during the reading process is another important factor in both reading processes as revealed by the literature. The number of fixations per line, duration of fixations, and regressions are important aspects of the eye-movement habits of readers. Some authorities have found the eye-movement habits of good readers to be definitely better than the eye-movement habits of poor readers, while other authorities have found that there are significant individual differences in the eye-movements of readers; and, that the purpose for which one reads has much to do with the character of the eye-movement habits.

Authorities agree that the ultimate goal of reading, oral and/or silent, is the comprehension of ideas. Therefore, eye-movement habits, vocabulary development, rate of reading, background of experience, and intellectual ability are factors which influence the degree of comprehension one attains while reading.

As a result of the literature reviewed it was revealed that, in general, authorities agree that there is a positive relationship between oral and silent reading. However, there is much diversity among them as to the extent of this relationship as indicated in the findings cited

by authorities relative to those aspects of oral and silent reading treated in this study.

CHAPTER II

PRESENTATION AND INTERPRETATION OF DATA

Introductory Statement

In this study, the writer determined, compared and related comprehension, rate and eye-movement patterns in the oral and silent reading performances of a selected group of good and poor college freshman readers. The administration of the tests and photography of eye-movement patterns in reading were done by the writer during the months of February and March, 1960. The group of good readers was given the title, Group A and the group of poor readers was given the title, Group B. This chapter presents and interprets the data required by the purposes of the study. Each purpose stated in the preceding chapter is answered in sections following the general description of procedures.

General Procedures Followed in Treatment of Data

In order to determine the general levels of silent reading ability of Groups A and B the writer averaged the results of their performances on a standardized silent reading test to give an over-all indication of their skill in silent reading. The oral reading accuracy and comprehension scores made by the subjects in the respective groups were averaged to give each subject a general score on the test used. These general scores were then averaged in order to get a general picture of the two groups' oral reading ability.

Determination of the subjects' levels of achievement in the specific reas of comprehension and rate in oral and silent reading entailed (1) sing the results from separate parts of the silent and oral reading tests hich measured these abilities and (2) computing measures of central tend- ncy and variability in order to obtain statistical evidence of their abil- ties in these areas. The writer was unable to obtain measures of the roups' eye-movements during oral reading; however, the eye-movement meas- res derived from photographing the groups' eye-movements during silent eading were reported; and, where possible, an attempt was made to relate ertain of these measures to the groups' performances in the area of ccuracy on the oral reading test.

In order to determine the relationship existing between the various omponents of oral and silent reading coefficients of correlations were omputed. Fisher's "t" scores were computed in order to determine the ifferences inherent in the groups' oral and silent reading patterns. ll statistical findings were analyzed and interpreted at the .05 level f confidence.

General Levels of Silent Reading and Measures of Differences between Them

The data pertaining to the groups' general levels of silent reading nd the differences between these measures are presented in Tables 1 and and Figure 1.

General Levels as Measured by the Iowa Silent Reading Test.--Table presents the frequency distribution and percentage of scores made by roups A and B on this test. Graphic representations of the frequency istributions of scores for both groups are given in Figure 1. The data

TABLE 1

FREQUENCY DISTRIBUTION AND PERCENTAGE OF GENERAL SILENT READING SCORES FOR GROUPS A AND B

Group A			Group B		
Scores	F	%	Scores	F	%
186-187	1	5	156-158	2	10
184-185	1	5	153-155		
182-183			150-152	4	20
180-181	2	10	147-149	2	10
178-179	2	10	144-146	3	15
176-177	4	20	141-143	3	15
174-175	1	5	138-140	2	10
172-173	2	10	135-137	1	5
170-171	1	5	132-134	2	10
168-169	5	25	129-131	1	5
166-167	1	5			
Total	20	100	Total	20	100

relative to the two groups' levels of achievement in this area are found in Table 2. As given there, the inclusive range of scores for Group A was 21; the median score was 175.5; the mean, 174.7; its standard error, 1.29; and the standard deviation, 5.62. There were 11 cases above the mean and 9 below the mean. Likewise, for Group B the inclusive range of scores was 27; the median score was 144.5; the mean 144.2; its standard error, 1.72; and the standard deviation, 7.19. There were 9 cases

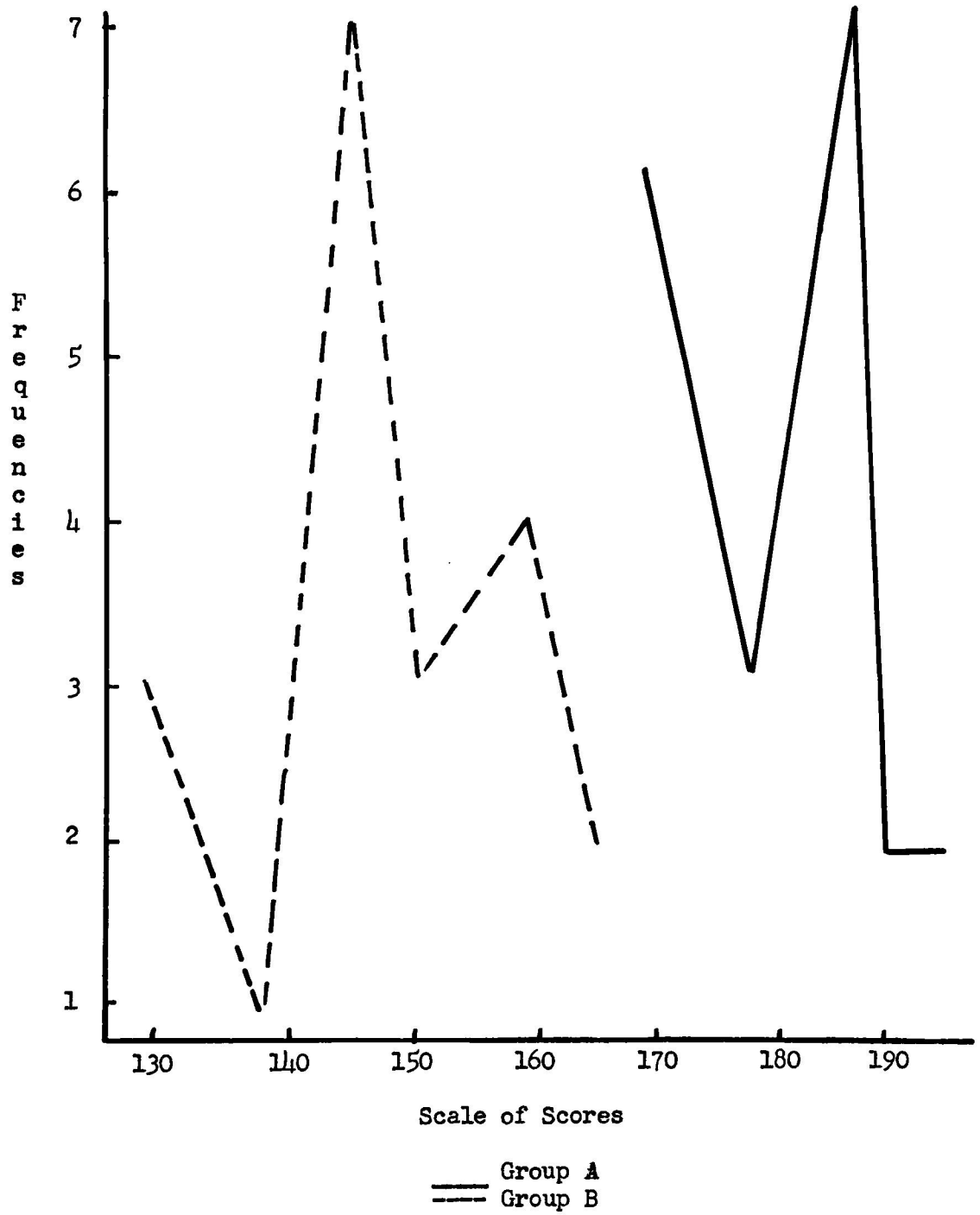

Fig. 1.-Frequency Polygons of
General Silent Reading Scores for Groups A and B

above the mean and 11 below. The graphic representations, relative position of the means and medians, and the standard deviations in terms of the number of cases that fell between one standard deviation above and below the mean in the two groups indicated that the distribution of scores in Group A was slightly skewed in a negative direction, while Group B's tended to approach normality. These measures also indicated that Group B was more variable than Group A. Moreover, the mean and median scores reported for Group A indicated that their average reading grade level was slightly above the college freshman level; whereas, the mean and median score obtained for Group B revealed that their average reading grade level was equivalent to that of one reading on the seventh grade level.

TABLE 2

COMPARATIVE DATA DERIVED FROM COMPUTATIONS OF THE GROUPS' PERFORMANCES ON A TEST OF GENERAL SILENT READING ABILITY

Measures	Group A		Group B
Range	21		27
Mean	174.7		144.2
Median	175.5		144.5
SD	5.62		7.19
SEM	1.29		1.72
Diff. of Means		30.5	
σ_{d_M}		2.15	
"t"		14.24	
Required "t" .05 level		2.093	

Measures of Silent Reading Differences between Groups A and B.--As given in Table 2, the difference between the means of the two groups was 30.5, with the standard error of the difference between the two being 2.15. The "t" test of the difference between uncorrelated means was 14.24; therefore, the obtained difference between the means was significant at the .05 level of confidence. The differences between the statistical findings of the two groups indicated that Group A was definitely better in general silent reading ability than Group B.

General Levels of Oral Reading and Measures of Differences between Them

The data relative to these aspects of the oral reading performances of the two groups are presented in Tables 3 and 4 and Figure 2.

General Levels as Measured by the Gilmore Oral Reading Test.--The frequency distribution and percentage of scores made by Groups A and B in general oral reading ability are given in Table 3, with graphic representations of these distributions being found in Figure 2. Table 4 presents data relative to the groups levels of achievement. As reported there, the inclusive range of scores for Group A was 18; the median, 68.5; the mean score, 67.8; its standard error, .91; and the standard deviation, 4.06. There were 13 cases above the mean and 9 below. Group B's inclusive range of scores was 18; median score, 53.5; mean, 51.2; its standard error, 1.24; and the standard deviation, 5.42. 11 cases fell above the mean and 9 cases fell below the mean. The graphic representations, differences between the means and medians, and standard deviations of each group revealed that both groups' distributions of scores were negatively skewed; also, both groups appeared to be more homogeneous rather

TABLE 3

FREQUENCY DISTRIBUTION AND PERCENTAGE OF GENERAL ORAL READING SCORES FOR GROUPS A AND B

Group A			Group B		
Scores	F	%	Scores	F	%
74-75	1	5	58-59	1	5
72-73	2	10	56-57	5	25
70-71	4	20	54-55	4	20
68-69	6	30	52-53	1	5
66-67	2	10	50-51	2	10
64-65	3	15	48-49		
62-63			46-47	3	15
60-61	1	5	44-45	2	10
58-59			42-43	1	5
56-57	1	5	40-41	1	5
Total	20	100	Total	20	100

than heterogeneous with respect to general oral reading ability. In addition, the data indicated that Group A's average oral reading ability was above the 9.8 grade level; whereas, Group B's average oral reading score indicated that they were reading orally below the 9.8 grade level.

Measures of Oral Reading Differences between Groups A and B.--The differences between the two groups oral reading abilities are also given in Table 4. As presented there, the difference between the means of the

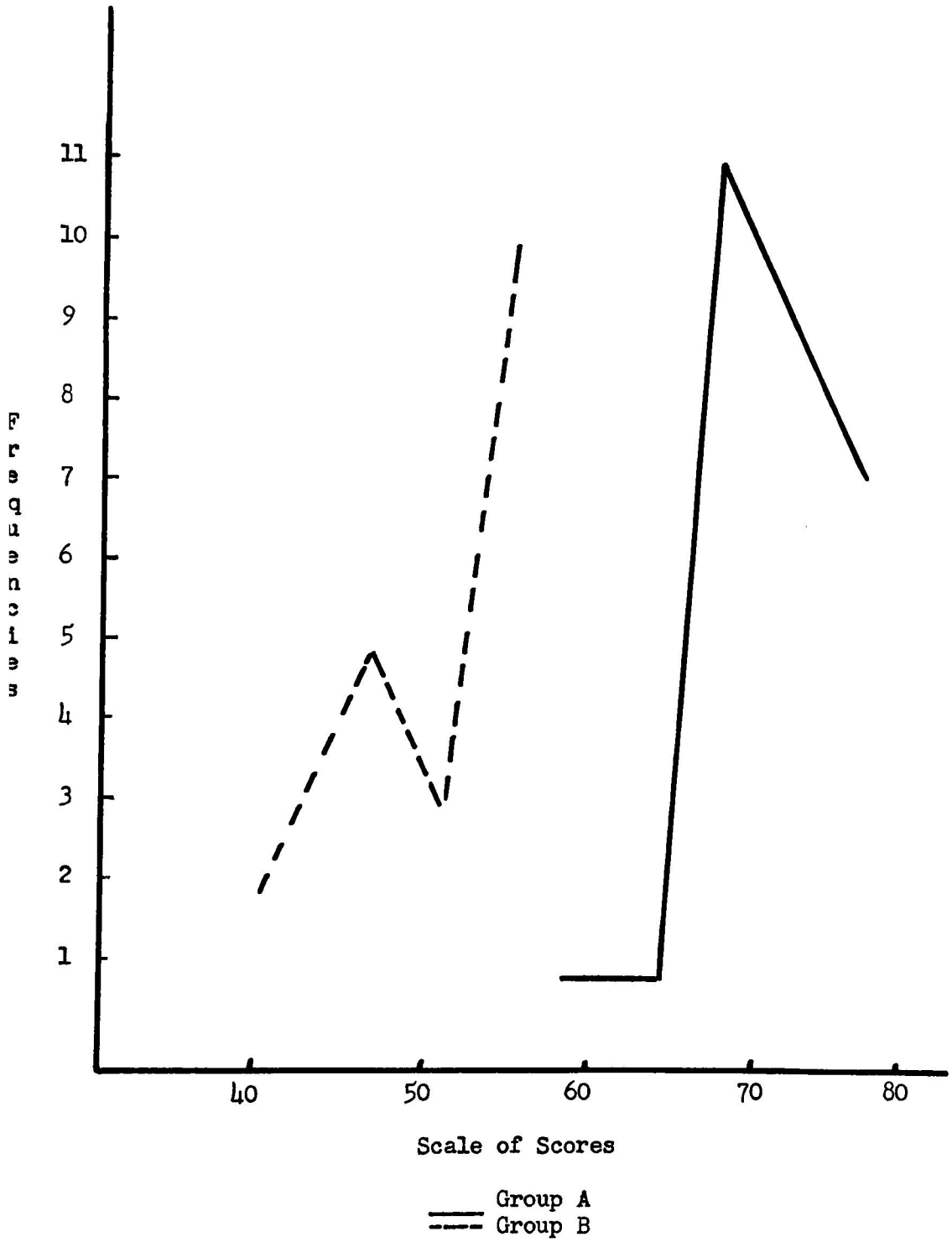

Fig. 2.-Frequency Polygons of General Oral Reading Scores for Groups A and B

TABLE 4

COMPARATIVE DATA DERIVED FROM COMPUTATIONS OF THE GROUPS' PERFORMANCES ON A TEST OF GENERAL ORAL READING ABILITY

Measures	Group A		Group B
Range	18		18
Mean	67.8		51.2
Median	68.5		53.5
SD	4.06		5.42
SEM	.91		1.24
Diff. of Means		16.6	
σ_{d_M}		1.54	
"t"		11.01	
Required "t" .05 level		2.093	

two groups was 16.6, with the standard error of the difference between the means being 1.54. The "t" test of the difference between uncorrelated means was 11.01; therefore, this obtained difference was significant at the .05 level of confidence. The statistical findings indicated that Group A was definitely better than Group B in general oral reading ability.

General Levels of Oral Reading Comprehension and Measures of Differences between Them

The data relative to the groups' levels of achievement and differences between them in the specific area of oral reading comprehension

are presented in Tables 5 and 6 and Figure 3.

General Levels of Oral Reading Comprehension as Measured by the Gilmore Oral Reading Test.--The frequency distribution and percentage of scores relative to the groups' levels of achievement in this area are given in Table 5 and graphic representations in Figure 3. Table 6 presents data relative to the two groups' levels of achievement in oral reading comprehension. As reported there, Group A's inclusive range of scores was 10; median, 46.2; mean, 45.8; standard error of the mean, .50; and the standard deviation, 2.18. There were 12 cases above the mean and 8 below. In like manner, Group B's inclusive range of scores was 20; median score, 37.5; mean, 36.8; its standard error, 1.10; and the standard deviation, 4.79; 12 cases fell above the mean and 9 below. Consideration of the graphic representations, differences between the means and medians, and standard deviations for both groups indicated that Group A's and Group B's distributions of scores were skewed in a negative direction. Further manipulation of these data revealed that Group B was more variable than Group A.

Measures of Differences in Oral Reading Comprehension of Groups A and B.--As given in Table 6, the difference between the means of the two groups was 9.0; and the standard error of this difference was 1.21. The "t" test of the difference between means yielded a score of 7.99 which was significant at the .05 level of confidence. On the basis of these findings it was concluded that Group A was definitely better than Group B in oral reading comprehension.

TABLE 5

FREQUENCY DISTRIBUTION AND PERCENTAGE OF ORAL READING COMPREHENSION SCORES FOR GROUPS A AND B

Group A			Group B		
Scores	F	%	Scores	F	%
49	2	10	45-46	1	5
48	1	5	43-44		
47	6	30	41-42	4	20
46	3	15	39-40	3	15
45	6	30	37-38	4	20
44			35-36	2	10
43			33-34	3	15
42			31-32		
41	1	5	29-30	2	10
40	1	5	27-28		
			25-26	1	5
Total	20	100	Total	20	100

General Levels of Silent Reading Comprehension and Measures of Differences between Them

The findings obtained as indicative of Groups A and B's levels of achievement and differences between these measures are presented in Tables 7 and 8 and Figure 4.

General Levels of Silent Reading Comprehension as Measured by the Iowa Silent Reading Test.--Table 7 presents the frequency Distribution

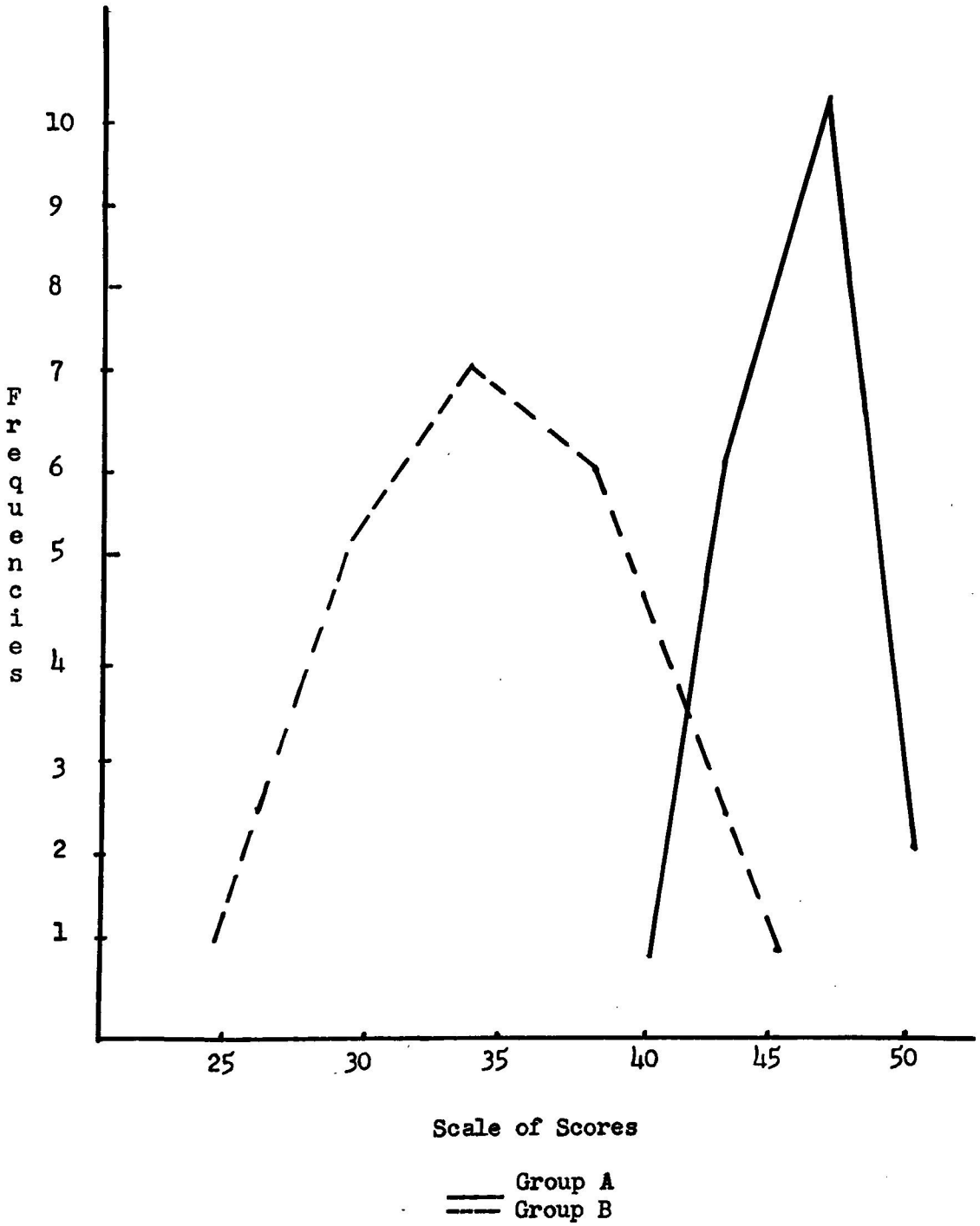

Fig. 3.-Frequency Polygons of Oral Reading Comprehension Scores for Groups A and B

TABLE 6

COMPARATIVE DATA DERIVED FROM COMPUTATIONS OF THE GROUPS' PERFORMANCES IN ORAL READING COMPREHENSION

Measures	Group A		Group B
Range	10		20
Mean	45.8		36.8
Median	46.2		37.5
SD	2.18		4.79
SEM	.50		1.10
Diff. Of Means		9.0	
σ_{d_M}		1.21	
"t"		7.99	
Required "t" .05 level		2.093	

and percentage of scores made by the groups' in this area; while, Figure 4 gives graphic representations of these distributions. Table 8 presents data relative to the groups' levels of achievement. As found there, Group A's inclusive range of scores was 30; median, 183.5; mean, 182; standard error of the mean, 2.19; and the standard deviation, 9.53. There were 11 cases above the mean and 9 below. Group B's inclusive range of scores was 36; median, 158; mean score, 158.4; standard error of the mean, 2.18; and the standard deviation, 9.49. There were 8 cases above the mean and 12 below the mean. Consideration of these findings indicated that the distribution of scores for Group A was negatively skewed

TABLE 7

FREQUENCY DISTRIBUTION AND PERCENTAGE OF SILENT READING COMPREHENSION SCORES FOR GROUPS A AND B

Group A			Group B		
Scores	F	%	Scores	F	%
196-197	1	5	175-177	1	5
193-195	2	10	172-174	2	10
190-192	4	20	169-171	1	5
187-189	1	5	166-168		
184-186	2	10	163-165	1	5
181-183	1	5	160-162	2	10
178-180			157-159	6	30
175-177	3	15	154-156	3	15
172-174	2	10	151-153	1	5
169-171	3	15	148-150		
166-168	1	5	145-147	1	5
			142-144		
			139-141	2	10
Total	20	100	Total	20	100

and those for Group B tended to approach normality. These measures of variability reported also indicated that there was more dispersion among the scores made by Group B than for those of Group A.

Measures of Differences between Silent Reading Comprehension of Groups A and B.--Table 8 also presents data relative to the differences

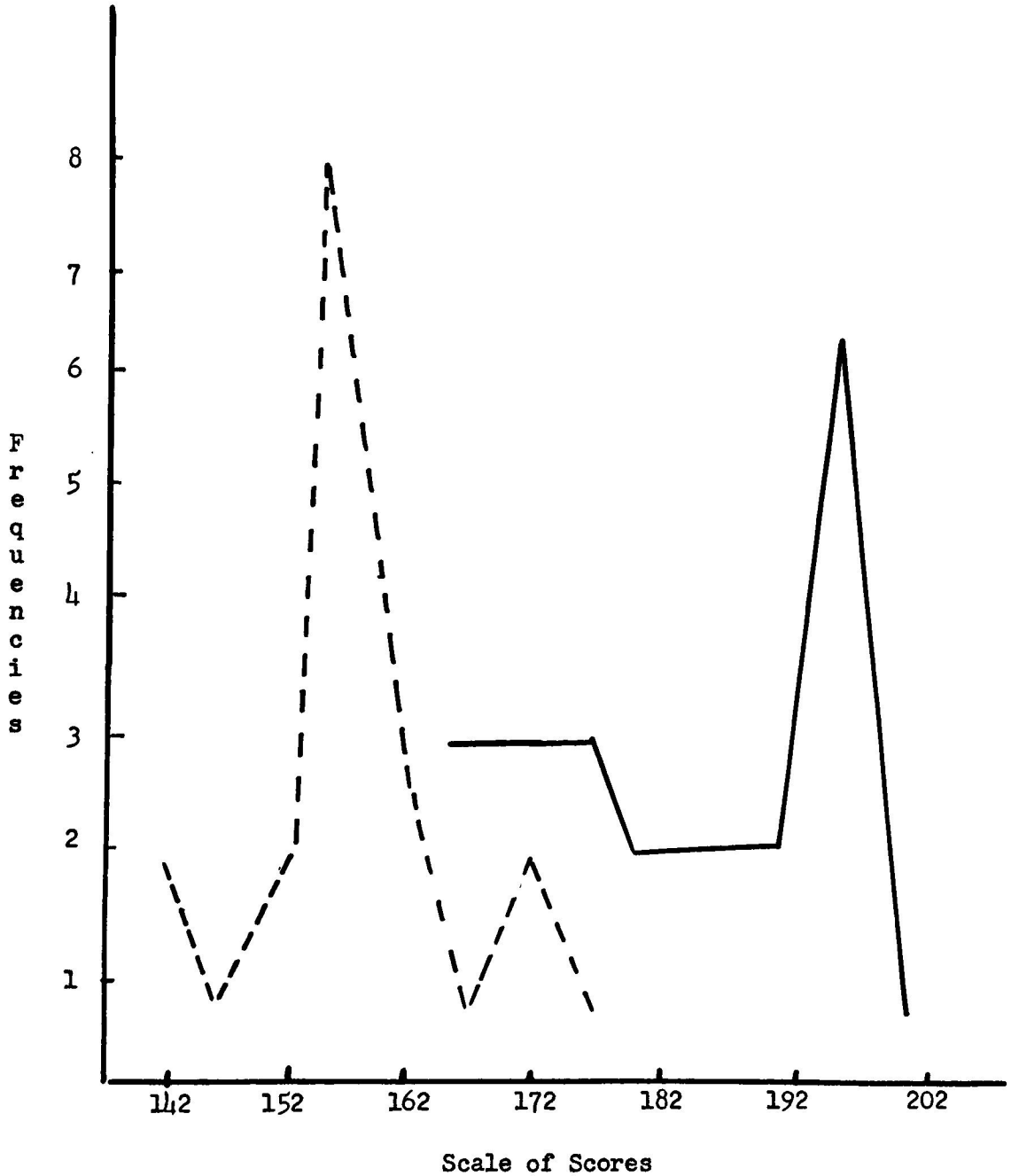

Fig.4.-Frequency Polygons of Silent Reading Comprehension Scores for Groups A and B

TABLE 8

COMPARATIVE DATA DERIVED FROM COMPUTATIONS OF THE GROUPS' PERFORMANCES IN SILENT READING COMPREHENSION

Measures	Group A		Group B
Range	30		36
Mean	182		158.4
Median	183.5		158
SD	9.53		9.49
SEM	2.19		2.18
Diff. of Means		23.6	
σ_{d_M}		3.09	
"t"		7.34	
Required "t" .05 level		2.093	

between the groups' levels of achievement. As given there, the difference between the means of the two groups was 23.6, with the standard error of this difference being 3.09. A score of 7.34 was obtained from computing a "t" test of the difference between uncorrelated means in equal samples. This obtained difference was significant at the .05 level of confidence. Therefore, on the basis of the statistical findings, it was concluded that Group A was better than Group B in silent reading comprehension.

General Levels of Oral Reading Rate and Measures of Differences between Them

The results of the two groups' performances in the area of oral reading rate are given in Tables 9 and 10 and Figure 5.

General Levels of Oral Reading Rate as Measured by the Gilmore Oral Reading Test.--Table 9 presents the frequency distribution and percentage of scores made by both groups, while Figure 5 presents graphic representations of these distributions. Table 10 gives the data relative to the groups' levels of achievement in this area. As found there, the inclusive range of scores for Group A was 61; the median score 145; mean, 145.5; its standard error, 3.79; and the standard deviation, 16.54. There were 9 cases above the mean and 11 below. Group B's inclusive range of scores was 96; median, 144.5; mean, 143; standard error of the mean, 5.19; and the standard deviation, 22.65; 12 cases were above the mean and 8 below. The graphical representations, means and medians for both groups, and the standard deviations indicated that Group A's scores tended to be slightly skewed in a positive direction and Group B's in a negative direction. Further consideration of their levels of achievement indicated that Group B was more variable than Group A.

Measures of Differences in Oral Reading Rate of Groups A and B.--As given in Table 10, the difference between the means of the two groups was 2.5; and the standard error of this difference, 6.43. The "t" test of the difference between means yielded a score of .39; therefore, the obtained difference between the means of the two groups was not significant at the .05 level of confidence. It was concluded that there was no significant statistical difference between the oral reading rates of the two groups. Both groups appeared to read orally at about the same speed.

TABLE 9

FREQUENCY DISTRIBUTION AND PERCENTAGE OF ORAL READING RATE SCORES FOR GROUPS A AND B

Group A			Group B		
Scores	F	%	Scores	F	%
173-177	1	5	185-194	1	5
168-172	1	5	175-184	1	5
163-167			165-174	1	5
158-162	2	10	155-164	2	10
153-157	2	10	145-154	5	25
148-152	3	15	135-144	4	20
143-147	2	10	125-134	2	10
138-142	3	15	115-124	1	5
133-137	1	5	105-114	2	10
128-132	1	5	95-104	1	5
123-127					
118-122	1	5			
113-117	3	15			
Total	20	100	Total	20	100

General Levels of Silent Reading Rate and Measures of Differences between Them

The data pertaining to the groups' levels of achievement and differences inherent among them are presented in Tables 11 and 12 and Figure 6.

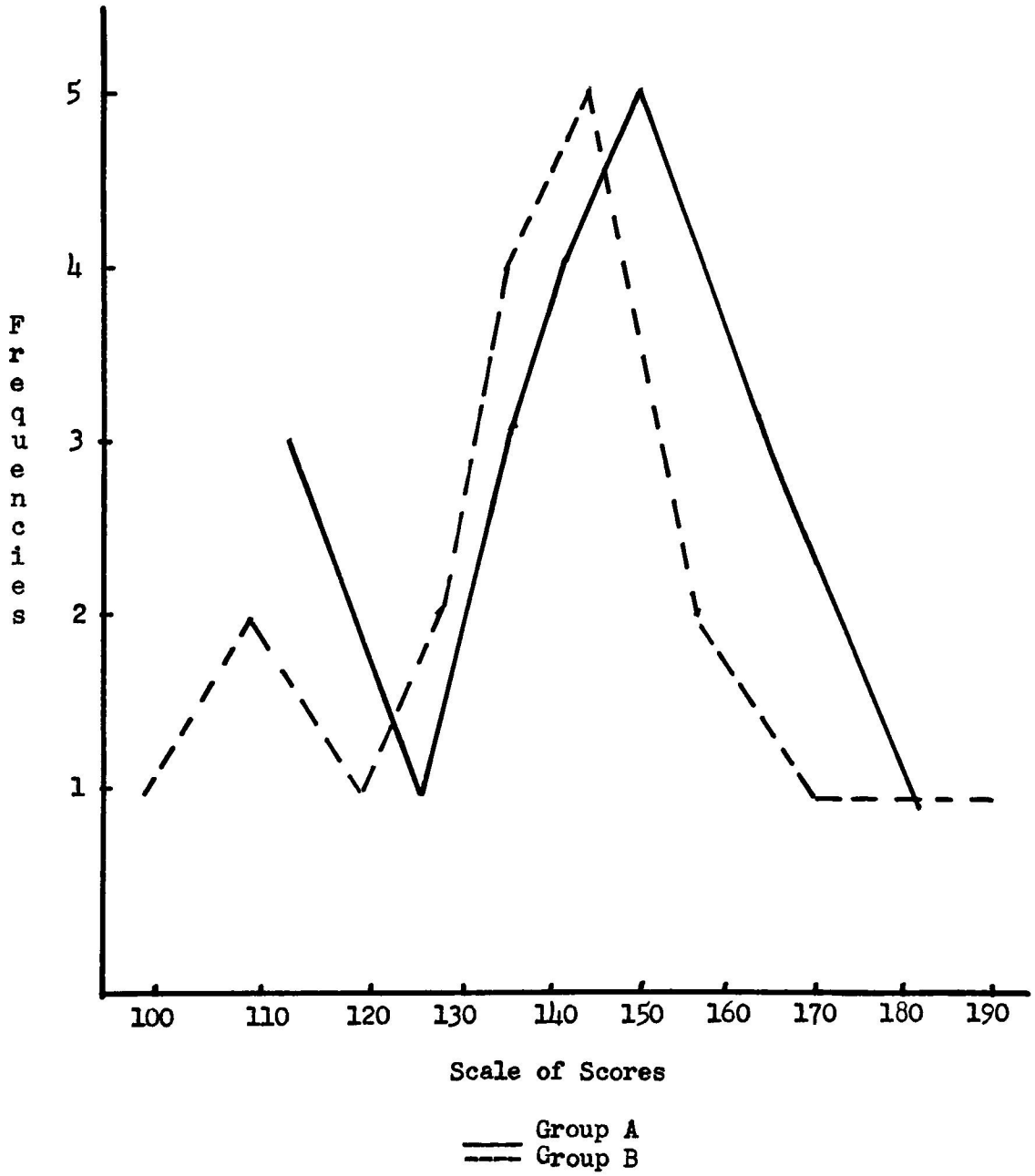

Fig. 5.-Frequency Polygons of Oral Reading Rate Scores for Groups A and B

TABLE 10

COMPARATIVE DATA DERIVED FROM COMPUTATIONS OF THE GROUPS' PERFORMANCES IN ORAL READING RATE

Measures	Group A		Group B
Range	61		96
Mean	145.5		143
Median	145		144.5
SD	16.54		22.65
SEM	3.79		5.19
Diff. of Means		2.5	
σ_{d_M}		6.43	
"t"		.39	
Required "t" .05 level		2.093	

General Levels of Silent Reading Rate as Measured by the Iowa Silent Reading Test.—The Frequency distribution and percentage of scores relative to the groups' levels of achievement in the area of silent reading rate are given in Table 11, and graphic representations in Figure 6. Table 12 presents the data pertaining to the two groups' levels of achievement in this area. As reported there, Group A's inclusive range of scores was 48; the median, 185.8; mean score, 187; its standard error, 3.20; and the standard deviation, 13.96. There were 9 cases above the mean and 9 cases below the mean. Likewise, for Group B the inclusive range of scores was 68; the median score, 175.6; mean, 180; its standard error,

TABLE 11

FREQUENCY DISTRIBUTION AND PERCENTAGE OF SILENT READING RATE SCORES FOR GROUPS A AND B

Group A			Group B		
Scores	F	%	Scores	F	%
210-214	1	5	215-219	1	5
205-209	2	10	210-214		
200-204	2	10	205-209	1	5
195-199	2	10	200-204	1	5
190-194			195-199	3	15
185-189	4	20	190-194		
180-184	3	15	185-189		
175-179	1	5	180-184	1	5
170-174	2	10	175-179	4	20
165-169	3	15	170-174	4	20
			165-169	3	15
			160-164		
			155-159		
			150-154	2	10
Total	20	100	Total	20	100

3.94; and the standard deviation, 17.02. There were 7 cases above the mean and 13 cases below. Consideration of this data in terms of the graphic representations, differences between the means and medians, and standard deviations for both groups indicated that both distributions

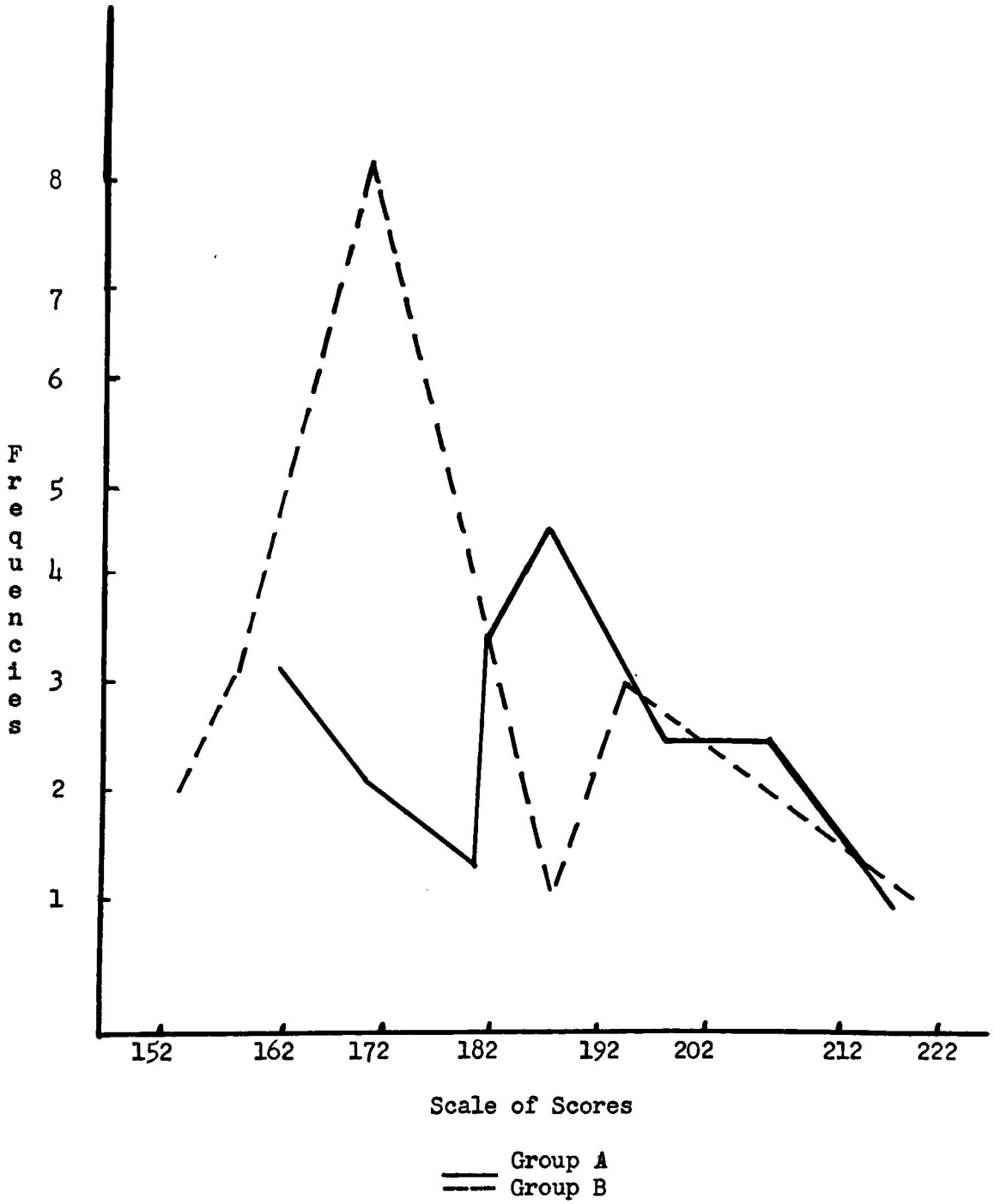

Fig. 6.-Frequency Polygons of Silent Reading Rate Scores for Groups A and B

TABLE 12

COMPARATIVE DATA DERIVED FROM COMPUTATIONS OF THE GROUPS' PERFORMANCES IN SILENT READING RATE

Measures	Group A		Group B
Range	48		68
Mean	187		180
Median	185.8		175.6
SD	13.96		17.02
SEM	3.20		3.94
Diff. of Means		7	
σ_{d_M}		5.08	
"t"		1.22	
Required "t" .05 level		2.093	

were positively skewed; and that Group B's scores were more dispersed than those for Group A.

Measures of Differences in Silent Reading Rate of Groups A and B.— As also found in Table 12, the difference between the means of the two groups was 7, with the standard error of this difference being 5.08. The "t" test of the difference between uncorrelated means in equal samples yielded a score of 1.22. Consequently, the obtained difference between the means of the two groups was not significant at the .05 level of confidence, and indicated that there was no significant difference between the silent reading rates of the two groups. Both groups appeared

to read silently at about the same rate.

General Levels of Fixations During Silent Reading and Measures of Differences between Them

The results of the two groups' performances with respect to the number of fixations made during silent reading are presented in Tables 13 and 14 and Figure 7.

Fixations in Eye-Movement Patterns as Measured by the Reading Eye.— Table 13 presents the frequency distribution and percentage of fixations made by Groups A and B, while Figure 7 presents graphic representations of these distributions. Table 14 gives the data relative to the groups' levels of achievement. As presented there, the inclusive range of scores for Group A was 62; the median score, 80.1; mean, 81.5; its standard error, 3.19; and the standard deviation, 13.9; 11 cases were above the mean and 9 below. Similarly, Group B's inclusive range was 42; median, 88; mean score, 90.7; standard error of the mean, 2.95; and the standard deviation, 12.9. There were 13 cases above the mean and 7 below the mean. The graphical representations, means and medians for both groups, and the standard deviations indicated that both Groups' scores were skewed in a positive direction. Further consideration of these measures indicated that Group A was more variable than Group B; and, Group A's average fixational level was well above the college level, while Group B's was almost at the college level.

Measures of Differences in Patterns of Fixations of Groups A and B.-- As also given in Table 14, the difference between the means of the two groups was 9.2; and the standard error of this difference was 4.34. The

TABLE 13

FREQUENCY DISTRIBUTION AND PERCENTAGE OF FIXATIONS FOR FOR GROUPS A AND B

Group A			Group B		
Scores	F	%	Scores	F	%
107-111	1	5	114-116	2	10
102-106	1	5	111-113	2	10
97-101	1	5	108-110		
92-96	2	10	105-107		
87-91	1	5	102-104		
82-86	2	10	99-101		
77-81	7	35	96-98		
72-76	1	5	93-95	3	15
67-71	1	5	90-92	1	5
62-66	2	10	87-89	4	20
57-61			84-86	3	15
52-56			81-83	1	5
47-51	1	5	78-80	3	15
			75-77	1	5
			72-74		
Total	20	100	Total	20	100

"t" test of the difference between means yielded a score of 2.124. Therefore, the obtained difference was significant at the .05 level of confidence. As a result of the statistical findings, it was concluded

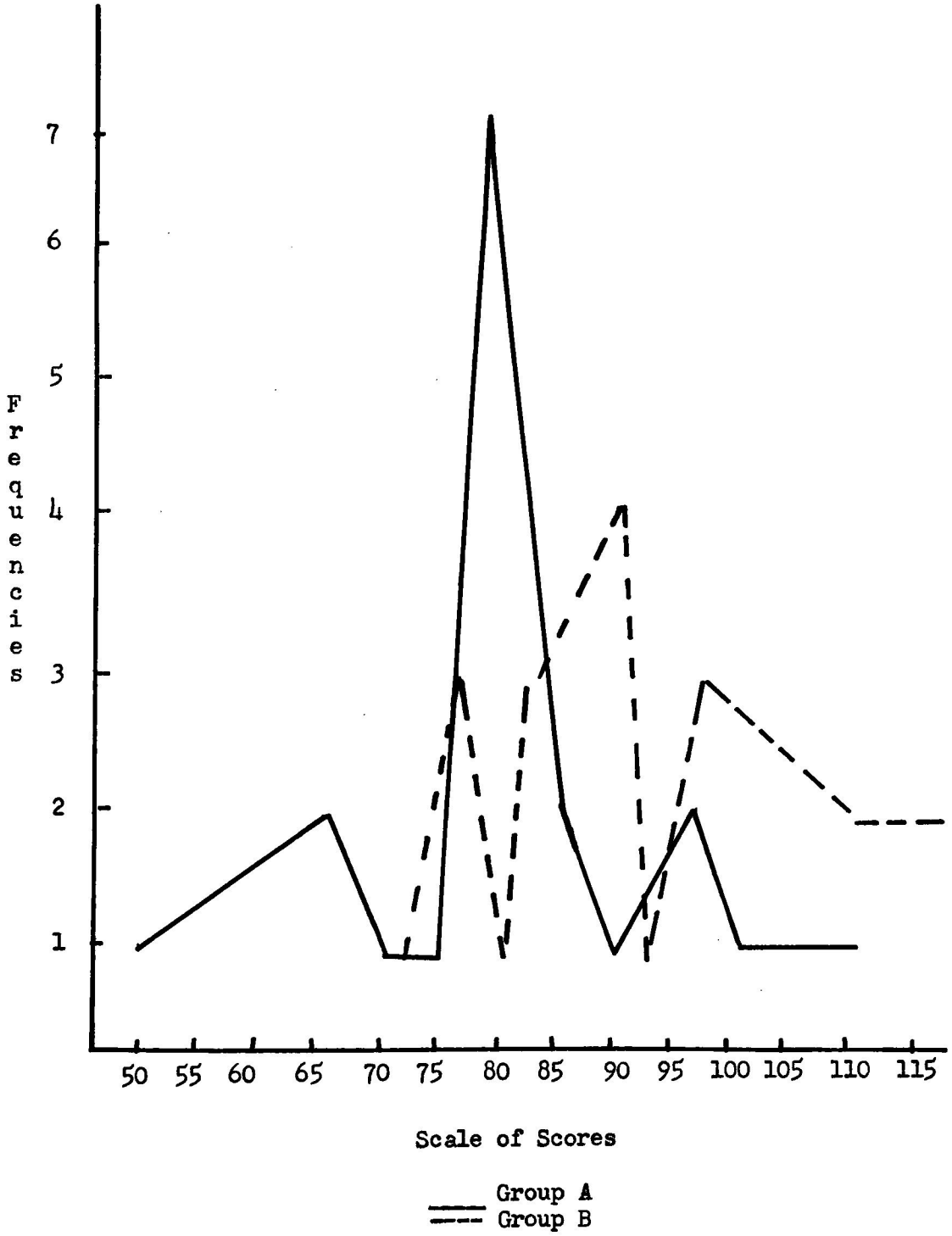

Fig. 7.-Frequency Polygons of Fixations During Silent Reading for Groups A and B

that Group A definitely made fewer fixations in silent reading than Group B.

TABLE 14

COMPARATIVE DATA DERIVED FROM COMPUTATION OF THE NUMBER OF FIXATIONS MADE BY GROUPS A AND B DURING SILENT READING

Measures	Group A		Group B
Range	62		42
Mean	81.5		90.7
Median	80.1		88
SD	13.9		12.9
SEM	3.19		2.95
Diff. of Means		9.2	
σ_{d_M}		4.34	
"t"		2.124	
Required "t" .05 level		2.093	

General Levels of Regressions During Silent Reading And Measures of Differences between Them

The results of the two groups' performances relative to the number of regressions made during silent reading and differences between these measures are presented in Tables 15 and 16 and Figure 8.

Regressions in Silent Reading as Measured by the Reading Eye.-- Table 15 presents the frequency distribution and percentage of regressions made by the groups, while Figure 8 gives graphic representations of these

TABLE 15

FREQUENCY DISTRIBUTION AND PERCENTAGE OF REGRESSIONS MADE BY GROUPS A AND B DURING SILENT READING

Group A			Group B		
Scores	F	%	Scores	F	%
16	2	10	22-23	5	25
15			20-21	2	10
14	2	10	18-19		
13	1	5	16-17	5	25
12			14-15	1	5
11	3	15	12-13	3	15
10	1	5	10-11	3	15
9	3	15	8-9		
8	1	5	6-7		
7			4-5	1	5
6	1	5			
5	1	5			
4	2	10			
3	1	5			
2	2	10			
Total	20	100	Total	20	100

distributions. The data relative to the groups' levels of achievement are given in Table 16. As given there, Group A's inclusive range was

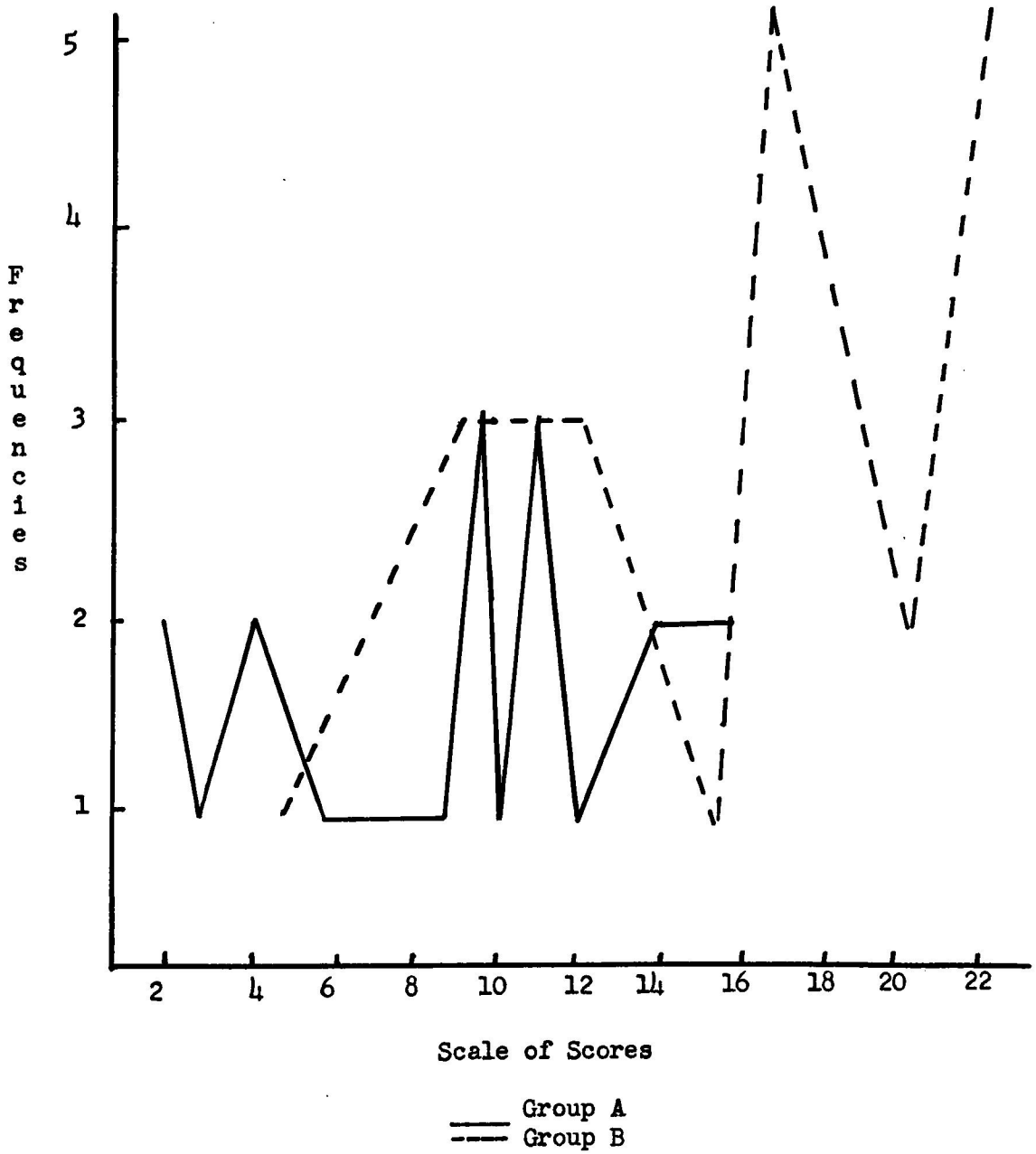

Fig. 8.-Frequency Polygons of Regressions During Silent Reading for Groups A and B

15; median, 9.2; mean score, 8.8; standard error of the mean, 1.04; and the standard deviation, 4.45. There were 8 cases above the mean and 12 cases below. Similarly, Group B's inclusive range was 19; median score, 16.3; mean, 16.2; its standard error, .58; and the standard deviation, 2.5. There were 11 cases above the mean and 9 below the mean. Consideration of these measures for both groups indicated that the distribution of scores for Group A was skewed in a negative direction, while Group B's was slightly skewed in the same direction. The measures of variability indicated that there was more dispersion among the scores made by Group B than for those of Group A. Moreover, these data indicated that Group A's average regression level was well above the college level, while Group B's was at approximately the 12.5 grade level.

Measures of Differences in Regressions made by Groups A and B.—The data pertaining to the differences between the number of regressions made by the groups are also given in Table 16. As found there, the difference between the means of the two groups was 7.4, with the standard error of the difference being 1.17. A score of 4.17 was obtained from computing a "t" test of the difference between the means. Consequently, the obtained difference was significant at the .05 level of confidence. On the basis of these findings, it was concluded that Group A made fewer regressions while reading silently than did Group B.

General Levels of Average Span of Recognition During Silent Reading and Measures of Differences between Them

The data relative to the groups' average span of recognition in silent reading and differences between them are given in Tables 17

TABLE 16

COMPARATIVE DATA DERIVED FROM COMPUTATION OF THE REGRESSIONS MADE BY GROUPS A AND B DURING SILENT READING

Measures	Group A		Group B
Range	15		19
Mean	8.8		16.2
Median	9.2		16.3
SD	4.45		2.5
SEM	1.04		.58
Diff. of Means		7.4	
σ_{d_M}		1.17	
"t"		4.17	
Required "t" .05 level		2.093	

and 18 and Figure 9.

Span of Recognition as Measured by the Reading Eye.--The frequency distribution and percentage of scores of the two groups in average span of recognition are given in Table 17 and graphic representations in Figure 9. Table 18 presents the data relative to the groups' levels of achievement in this area. As reported there, Group A's inclusive range was 1.16; median score, 1.25; the mean, 1.28; its standard error, .06; and the standard deviation, .25. There were 13 cases above the mean and 6 cases below. In like manner, Group B's inclusive range was .51;

TABLE 17

FREQUENCY DISTRIBUTION AND PERCENTAGE OF THE TWO GROUPS IN AVERAGE SPAN OF RECOGNITION DURING SILENT READING

Group A			Group B		
Scores	F	%	Scores	F	%
2.03-2.12	1	5	1.36-1.40	1	5
1.93-2.02			1.31-1.35	1	5
1.83-1.92			1.26-1.30	3	15
1.73-1.82			1.21-1.25		
1.63-1.72			1.16-1.20	3	15
1.53-1.62	2	10	1.11-1.15	5	25
1.43-1.52	1	5	1.06-1.10	3	15
1.33-1.42	1	5	1.01-1.05		
1.23-1.32	7	35	.96-1.00		
1.13-1.22	3	15	.91-.95		
1.03-1.12	2	10	.86-.90	4	20
.93-1.02	3	15			
Total	20	100	Total	20	100

median score, 1.14; mean, 1.13; standard error of the mean, .03; and the standard deviation, .15; 10 cases were above the mean and 10 were below the mean. Consideration of the graphic representations, differences between means and medians and standard deviations for both groups revealed that Group A's distribution of scores was positively

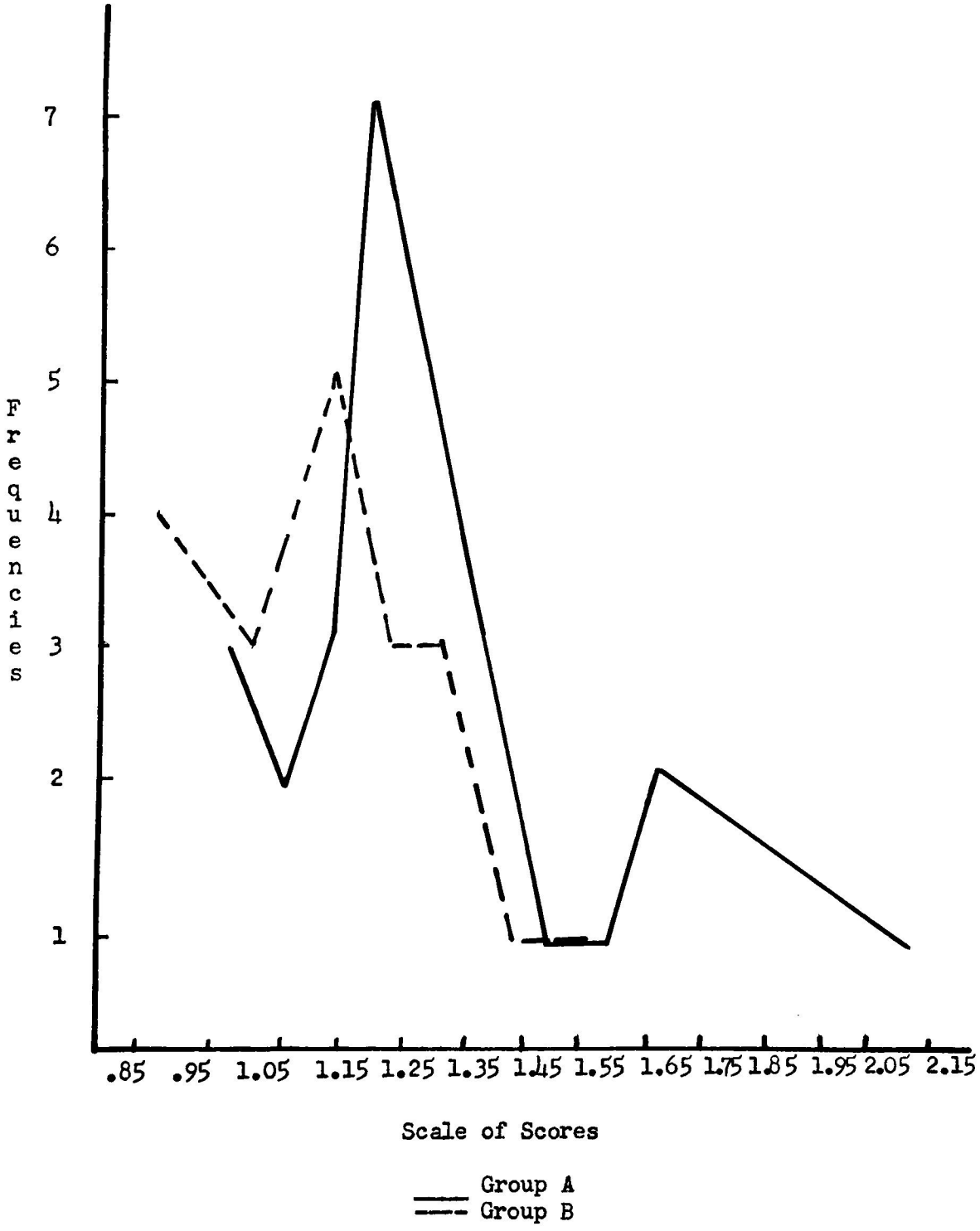

Fig. 9.-Frequency Polygons of Groups A's and B's Average Span of Recognition During Silent Reading

skewed, while Group B's was negatively skewed. Further manipulation of these data indicated that Group A was more variable than Group B. In addition, these measures indicated that the average level of span of recognition for Group A was well above the college level, while Group B's was slightly above this level.

TABLE 18

COMPARATIVE DATA DERIVED FROM COMPUTATIONS OF GROUPS A'S AND B'S AVERAGE SPAN OF RECOGNITION

Measures	Group A		Group B
Range	1.16		.51
Mean	1.28		1.13
Median	1.25		1.14
SD	.25		.15
SEM	.06		.03
Diff. of Means		.15	
σ_{d_M}		.07	
"t"		2.31	
Required "t" .05 level		2.093	

Measures of Differences between Recognition Spans of Groups A and B.--As also given in Table 18, the difference between the means of the two groups was .15; and the standard error of this difference was .07. The "t" test of the difference between means yielded a score of 2.31 which was significant at the .05 level of confidence. Therefore, it was

concluded that the average span of recognition of Group A was significantly larger than that of Group B.

General Levels of Average Duration of Fixations During Silent Reading and Measures of Differences between Them

The results of the two groups' performances relative to average duration of fixations are given in Tables 19 and 20 and Figure 10.

Durations of Fixations as Measured by the Reading Eye.--The frequency distribution and percentage of scores made by the groups are presented in Table 19, with graphic representations of these distributions being found in Figure 10. Table 20 presents the data relative to the two groups' levels of achievement. As presented there, Group A's inclusive range of scores was .15; the median score was .34; mean, .35; its standard error, .01; and the standard deviation, .04. There were 8 cases above the mean and 11 below the mean. Likewise, for Group B the inclusive range was .13; median score, .36; mean, .37; standard error of the mean, .01; and the standard deviation, .04; 9 cases were above the mean and 8 cases were below the mean. The graphic representations, the means and medians, and standard deviations of each group revealed that both groups' distributions of scores were skewed in a positive direction. Further consideration of these data indicated that Group A was more variable than Group B, and that both groups' average durations of fixations was below the first grade level.

Measures of Differences in Duration of Fixations in Groups A and B.--As given in Table 20, the difference between the means of the groups was .02, with the standard error of this difference being .01. The

TABLE 19

FREQUENCY DISTRIBUTION AND PERCENTAGE OF GROUPS A'S AND B'S AVERAGE DURATION OF FIXATIONS

Group A			Group B		
Scores	F	%	Scores	F	%
.41+	3	15	.41+	6	30
.41	1	5	.41	1	5
.40	1	5	.40	1	5
.39			.39	1	5
.38			.38	1	5
.37			.37	3	15
.36	3	15	.36	3	15
.35	1	5	.35		
.34	5	25	.34	1	5
.33			.33		
.32	1	5	.32	1	5
.31	1	5	.31		
.30	2	10	.30	1	5
.29	1	5	.29	1	5
.28					
.27	1	5			
Total	20	100	Total	20	100

"t" test of the difference between the means yielded a score of 1.52; therefore, the difference between the two groups' performances was not

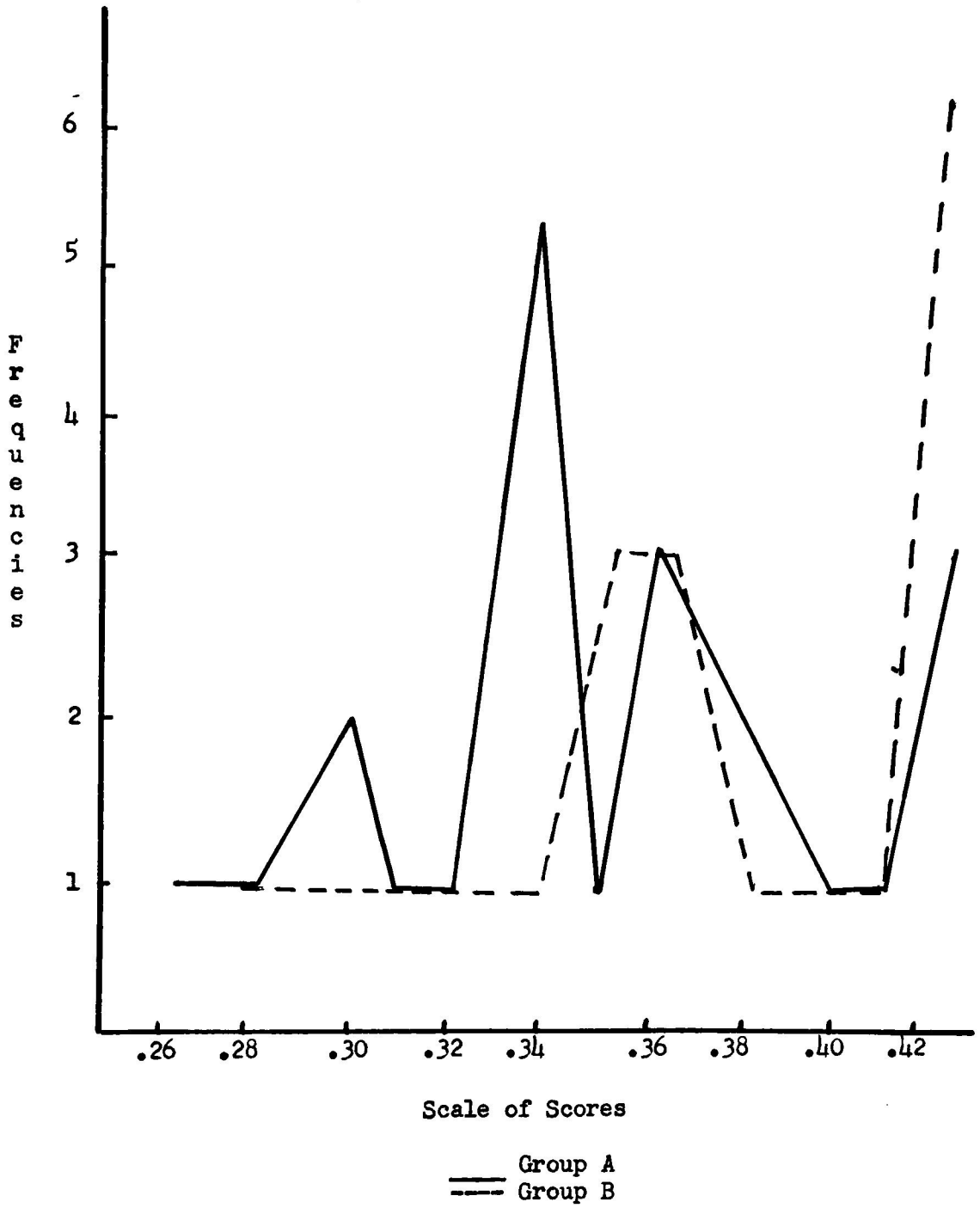

Fig. 10.-Frequency Polygons of Groups A's and B's Average Duration of Fixations During Silent Reading

significant at the .05 level of confidence. The conclusion reached relative to this aspect of the groups' eye-movement measures was that there was no statistically significant difference between average duration of fixations.

TABLE 20

COMPARATIVE DATA DERIVED FROM COMPUTATIONS OF THE GROUPS' AVERAGE DURATION OF FIXATIONS

Measures	Group A		Group B
Range	.15		.13
Mean	.35		.37
Median	.34		.36
SD	.04		.04
SEM	.01		.01
Diff. of Means		.02	
σ_{d_M}		.01	
"t"		1.52	
Required "t" .05 level		2.093	

General Levels of Comprehension Attained During the Eye-Movement Photography and Measures of Differences between Them

The Data pertaining to the groups' levels of comprehension attained and differences between them are found in Tables 21 and 22 and Figure 11.

General Levels of Reading Comprehension as Measured by the Reading Eye.--Table 21 presents the distribution and percentage of scores for both groups, while Figure 11 gives graphic representations of these distributions. Table 22 gives the information relative to the groups' levels of achievement in this area. As given there, Group A's inclusive range was 61; median score, 72.8; mean, 74; its standard error, 3.72; and the standard deviation; 16.2. There were 8 cases above the mean and 12 below. Similarly, Group B's inclusive range of scores was 51; the median score was 80.8; mean, 78.5; standard error of the mean, 3.04; and the standard deviation, 13.27; 11 cases were above the mean and 9 were below the mean. Consideration of these data in terms of respective means and medians, standard deviations and graphic representations indicated that for Group A the scores were positively skewed, while Group B's were negatively skewed. These measures also indicated that Group A was more variable than Group B.

Differences in Reading Comprehension of Groups A and B during Eye-Movement Photography.--As shown in Table 22, the difference between the means of the two groups was 4.5, with the standard error of this difference being 4.80. A "t" test of the difference between means yielded a score of .91 which was not significant at the .05 level of confidence. Therefore, it was concluded that there was no statistically significant difference between the levels of comprehension attained by the groups during the eye-movement photography.

TABLE 21

FREQUENCY DISTRIBUTION AND PERCENTAGE OF EYE-MOVEMENT COMPREHENSION SCORES FOR GROUPS A AND B

Group A			Group B		
Scores	F	%	Scores	F	%
100-104	2	10	100-104	1	5
95-99			95-99		
90-94	3	15	90-94	6	30
85-89			85-89		
80-84	3	15	80-84	4	20
75-79			75-79		
70-74	6	30	70-74	4	20
65-69			65-69		
60-64	3	15	60-64	4	20
55-59			55-59		
50-54	1	5	50-54	1	5
45-49					
40-44	2	10			
Total	20	100	Total	20	100

General Levels of Silent Reading Rate During Eye-Movement Photography and Measures of Differences between Them

The data relative to the groups' rate of reading during the eye-movement photography are presented in Tables 23 and 24 and Figure 12.

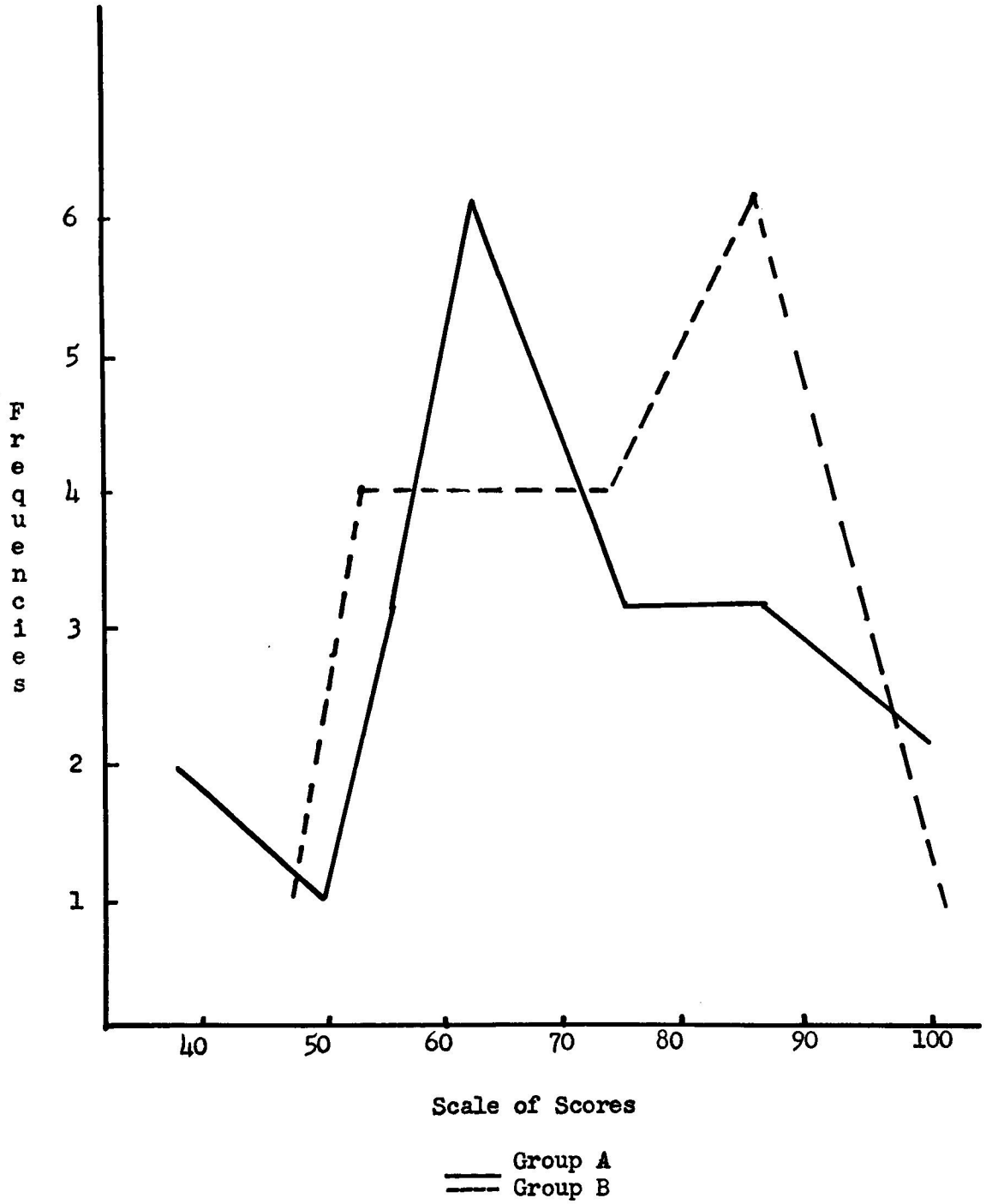

Fig. 11.-Frequency Polygons of Comprehension Scores for Groups A and B during Eye-Movement Photography

TABLE 22

COMPARATIVE DATA DERIVED FROM COMPUTATION OF GROUPS A'S AND B'S LEVELS OF COMPREHENSION ATTAINED DURING EYE-MOVEMENT PHOTOGRAPHY

Measures	Group A		Group B
Range	61		51
Mean	74		78.5
Median	72.8		80.8
SD	16.2		13.27
SEM	3.72		3.04
Diff. of Means		4.5	
σ_{d_M}		4.80	
"t"		.91	
Required "t" .05 level		2.093	

Reading Rate as Measured by the Reading Eye.--Table 23 presents the frequency distribution and corresponding percentages of rate of reading scores and Figure 12 gives graphic representations of these distributions. Table 24 presents the data relative to the groups' levels of achievement in this area. As reported there, Group A's inclusive range of scores was 163; median score, 196.5; mean, 201.5; standard error of the mean, 9.61; and the standard deviation, 41.9. There were 8 cases above the mean and 12 below. In like manner, Group B's inclusive range was 155; median score, 182.5; mean, 181;

TABLE 23

FREQUENCY DISTRIBUTION AND PERCENTAGE OF SCORES MADE BY GROUPS A AND B IN READING RATE DURING EYE-MOVEMENT PHOTOGRAPHY

Group A			Group B		
Scores	F	%	Scores	F	%
271-280	1	5	253-262	1	5
261-270	2	10	243-252	3	15
251-260			233-242	1	5
241-250	1	5	223-232		
231-240	1	5	213-222	1	5
221-230	2	10	203-212	1	5
211-220			193-202	3	15
201-210	1	5	183-192		
191-200	5	25	173-182	2	10
181-190	2	10	163-172	2	10
171-180	1	5	153-162		
161-170			143-152		
151-160	1	5	133-142		
141-150	2	10	123-132		
131-140			113-122	3	15
121-130			103-112	3	15
111-120	1	5			
Total	20	100	Total	20	100

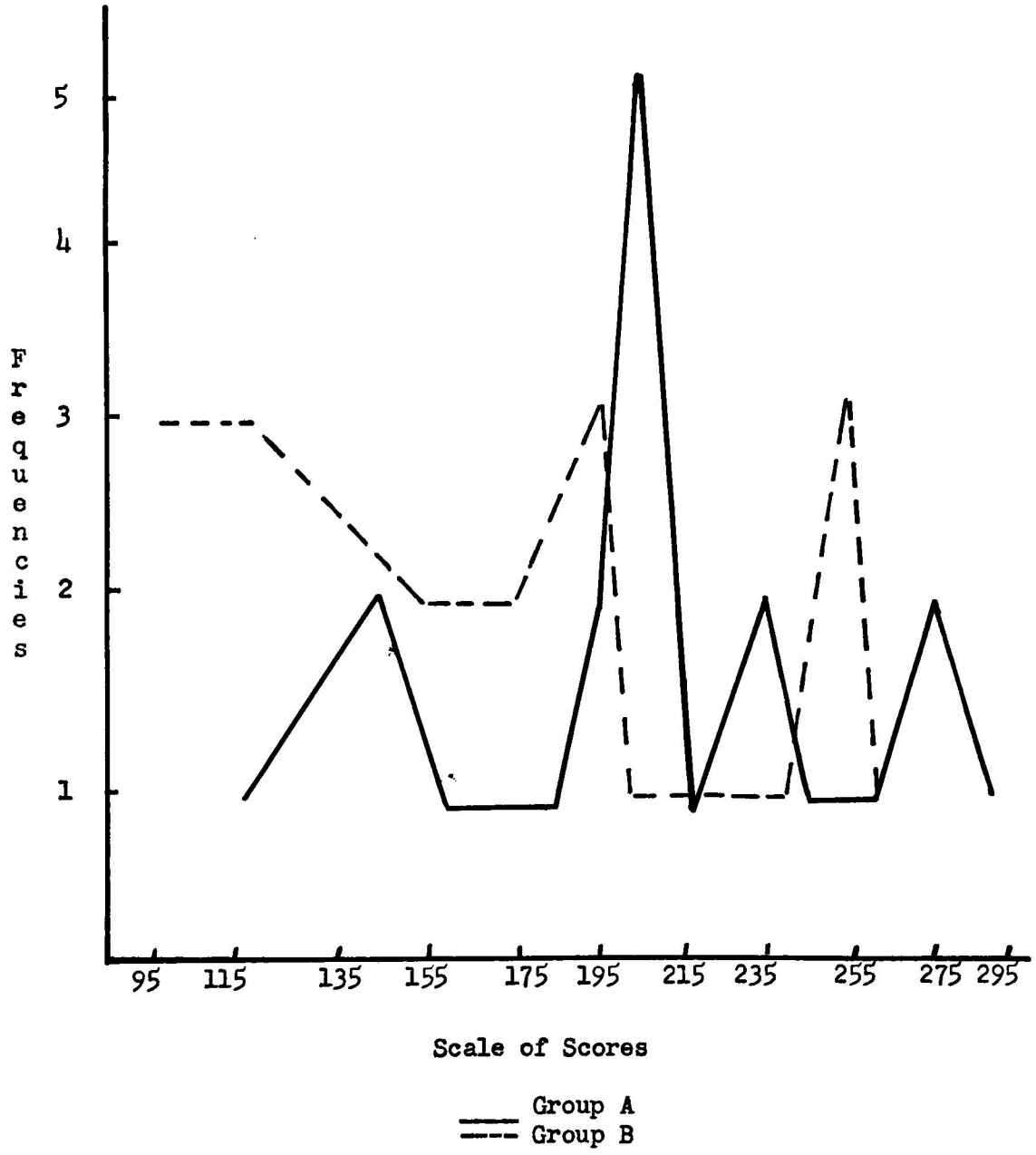

Fig. 12.-Frequency Polygons of Silent Reading Rate Scores For Groups A and B During Eye-Movement Photography

its standard error, 11.9; and the standard deviation, 51.9; 10 cases fell above the mean and 10 fell below the mean. Consideration of the measures of variability and central tendency for each group revealed that Group A's distribution of scores was positively skewed, while Group B's tended to be skewed in a negative direction. The measures of variability also indicated that Group A was more variable than Group B.

TABLE 24

COMPARATIVE DATA DERIVED FROM COMPUTATION OF GROUPS A'S AND B'S LEVELS OF READING RATES DURING EYE-MOVEMENT PHOTOGRAPHY

Measures	Group A		Group B
Range	163		155
Mean	201.5		181
Median	196.5		182.5
SD	41.9		51.9
SEM	9.61		11.9
Diff. of Means		20	
σ_{d_M}		15.3	
"t"		1.29	
Required "t" .05 level		2.093	

Differences in Rate of Reading of Groups A and B during Eye-Movement Photography.—The difference between the means of the two groups, as found in Table 24 was 20, and the standard error of this difference was

15.3. A "t" test of the difference between the means gave a score of 1.29 which was not significant at the .05 level of confidence. Therefore, the statistical findings indicated that there was no statistically significant difference between the reading rates of the two groups as measured by this instrument.

Results of Measures of Relationships between the Oral and Silent Reading Components

The data relative to the relationships which existed between the groups' performances in general oral and silent reading, oral and silent comprehension, and oral and silent rate are given in Table 25. As reported there, the obtained "r's" for Groups A and B were .28 and .48, respectively for general oral and silent reading ability. When these values were checked in a table of probability with 18 degrees of freedom, Group A's coefficient of correlation was far below the .444 required at the .05 level of confidence; whereas, the "r" for Group B was slightly above the required "r". Therefore, on the basis of the findings for Group A, it was concluded that those students who scored high on a test of general silent reading ability do not necessarily perform at the same level of proficiency when tested to determine their general levels of oral reading ability. Similarly, the findings for Group B led to the conclusion that students who seemingly do poorly on a test of general silent reading ability also tend to perform in a similar manner when given a test to determine their general oral reading levels.

When the oral and silent reading comprehension scores within both groups were related, as given in Table 25, an "r" of -.83 was obtained

TABLE 25

COEFFICIENTS OF CORRELATIONS AND THEIR STANDARD ERRORS USED AS A BASIS FOR DETERMINING THE RELATIONSHIPS BETWEEN THE GROUPS' PERFORMANCES IN GENERAL ORAL AND SILENT READING, ORAL AND SILENT COMPREHENSION, AND ORAL AND SILENT READING RATES

Test	Coefficient of Correlation		Standard Error	
	Group A	Group B	Group A	Group B
General Oral Reading General Silent Reading	.28	.48	.21	.18
Oral Reading Comprehension Silent Reading Comprehension	-.83	-.15	.07	.22
Oral Reading Rate Silent Reading Rate	.02	-.11	.23	.23

as indicative of the relationship existing between these two components for Group A; while, an "r" of -.15 was obtained for Group B. A check for the significance of the two coefficients in a table of probability revealed that Group A's "r" was far above the required "r" of .444 and Group B's "r" was far below. These findings, as related to the relationship inherent in the oral and silent reading comprehension scores for Group A, led to the conclusion that those students who performed at a high level of proficiency on one test are likely to make low scores on another test. In like manner, Group B's findings resulted in the conclusion that those students who made low scores on one test are likely to make high scores on another test measuring these

aspects of reading.

Determination of the relationship existing between the performances of the two groups in oral and silent reading rate which is also given in Table 25 resulted in an obtained "r" of .02 for Group and an "r" of -.11 for Group B. Consideration of these values in a table of probability with 18 degrees of freedom for significance indicated that both coefficients of correlations were far below the coefficient of .444 required at the .05 level of confidence. On the basis of the findings for Group A it was concluded that the rate at which they read silently did not seem to influence the rate at which they read orally and vice versa. Students who made high rate scores on one test are likely to be almost anywhere, within the total range, on another test in terms of scores. Group B's findings also led to the conclusion that the rate at which they read silently did not tend to influence their oral reading rates; and, in addition, if a low score is made in one testing situation it is quite likely that a high score will be made in another testing situation.

As previously stated, the writer was unable to obtain measures relative to the groups' eye-movements during oral reading. However, consideration of both groups' oral reading accuracy score in terms of the number of repetitions made did reveal that Group A tended to make fewer repetitions than Group B during oral reading. Therefore, it is quite possible that this observation does give some indication of a possible relationship existing between the number of oral and silent reading regressions of the two groups had this information been available.

Differences between the Relationships of the Groups

The writer had anticipated converting "r's" to "z" scores in order to determine the possible differences between the relationships of the groups. However, the correlation values were of such that the differences were obvious.

First of all, the fact that Group A's "r" between general oral and silent reading ability was not significant at the .05 level of confidence, while Group B's "r" was significant did warrant the conclusion that there was a significant statistical difference between these relationships of the good and poor readers. Secondly, with respect to oral and silent reading comprehension of the groups, the "r" for Group A was above the required "r" for significance and the "r" for Group B was far below. Therefore, it was concluded that there was a significant statistical difference between the oral and silent reading comprehension scores of the good and poor readers. Thirdly, both groups' coefficients of correlations between oral and silent reading rates were far below the "r" required at the .05 level of confidence. Consequently, the conclusion drawn was that there was no statistically significant difference between the oral and silent reading rates of the good and poor readers.

CHAPTER III

SUMMARY, CONCLUSIONS AND IMPLICATIONS

General Summary of the Delineation and Design of the Study.--This chapter presents information pertinent to a summary of the two previous chapters, and presents conclusions, implications and recommendations.

The importance of oral and silent reading in school and out-of-school activities is realized today, and it is generally agreed that the two reading processes have much in common. Silent reading is the individual's means of obtaining thoughts and ideas, while oral reading is the medium for transmitting these thoughts and ideas to others. Although most of the reading engaged in by college students and others is done silently, there are many occasions which demand oral reading. Moreover, it is apparent that there are differences inherent in the two reading processes; however, vocabulary development, comprehension ability, rate of reading, and correct mechanical habits of eye-movements are reading skills applicable to oral and silent reading.

The problem of this study evolved from the writer's observations in the Clark College reading laboratory of the oral and silent reading difficulties encountered by freshman students who took reading during the period of 1958-60. As a result of the difficulties noted, this study was conducted, using one group of students who took reading and one who did not, in order to compare and relate their oral and silent reading performances.

In this study the writer compared and related comprehension, rate and eye-movement patterns in the oral and silent reading performances of a selected group of good and poor readers enrolled in a college freshman class.

The general purpose of the study was to determine and compare the relationship between oral and silent reading abilities of a group of selected good and poor readers.

Specifically, this study answered these questions:

1. For the two selected groups of readers what were the levels of achievement in these general and specific areas?
    a. General levels of oral and silent reading
    b. Comprehension in oral reading
    c. Comprehension in silent reading
    d. Rate of oral reading
    e. Rate of silent reading
    f. Eye-movement patterns in silent reading
2. How did the two groups compare in the respective components of oral and silent reading?
3. Within each of the two groups what was the relationship between the oral and silent reading components and patterns enumerated?
4. What were the differences between these respective relationships found within the groups?
5. What educational implications could be drawn from the findings?

Forty freshman students enrolled at Clark College during the second semester of the 1959-60 academic year participated in this study. They were selected on the basis of their performances on the Iowa Silent Reading Test, Form Am, administered as a part of the freshman placement tests. Using these test scores, the writer divided the students into

two groups-those who scored at and above the eleventh grade reading level and those who scored below the ninth grade reading level. From these two groups, the forty students for this study were selected by random sampling. Therefore, the selected group of twenty good readers consisted of those students whose general reading ability was at and above the eleventh grade reading level, and the group of twenty poor readers was comprised of students whose general reading ability was below the ninth grade level as measured by the Iowa Test. The students in both groups came from and attended schools in Alabama, Florida and Georgia. Most of them attended schools in urban areas, while some went to schools in rural areas.

The group of poor readers used in this study received systematic training in the improvement of basic and specific reading skills for one semester at Clark College; whereas, the group of good readers received no such training through a reading improvement course. In spite of this fact, both groups were exposed to significant reading experiences in English classes and other subject areas during the freshman year. Experiences such as reading for main ideas, details, factual information, conclusions, vocabulary development, critical reading, etc., were common to both groups.

The Iowa Silent Reading Test was used to establish the levels of good and poor readers and as a basis for analyzing the specific silent reading habits of the subjects used in the study. The Gilmore Oral Reading Test was used to establish the subjects' general levels of oral reading and to analyze their specific oral reading performances. In addition, the Reading Eye was used to photograph and interpret the eye-

movement patterns of the two groups.

In order to fulfill the requirements of the purposes of this study, the research proceeded thusly:

1. Literature pertinent to the study was reviewed and summarized.

2. The descriptive survey method of research, utilizing the special techniques of testing, statistical, and analytical interpretation was used to collect and interpret the data for this study.

3. The Iowa Silent Reading Test was used to establish the groups on the basis of levels of good and poor silent reading and to analyze their specific silent reading abilities as designated by the purposes.

4. The Gilmore Oral Reading Test was administered to the two groups of students in order to establish the levels of good and poor oral reading and to analyze their specific oral reading abilities as designated by the purposes.

5. The eye-movement patterns in silent reading were photographed and interpreted through the use of the Reading Eye.

6. The data derived from the instruments were assembled into appropriate tables and figures as determined by the purposes of the research.

7. The data set forth in the tables were statistically treated through the computations of such measures as inclusive range, mean, median, standard error of the mean, standard deviation, and Pearson Product-moment Coefficient of Correlation.

8. Conclusions and recommendations were drawn.

The mean and median were the statistical measures used in order to determine the groups averages on each of the tests given. The range and standard deviation provided measures of scatter so that it was possible to see the relative homogeneity or heterogeneity of the scores. Measures of standard error were utilized to determine the significance of the various statistics, particularly the mean and coefficients of correlations; while, the Pearson Product-moment Coefficient of Correlation was used to determine the relationship between the oral

and silent reading components. Fisher's "t" scores were used for the computations of the differences between the various aspects of oral and silent reading.

This study was limited in several respects. Two groups of twenty Clark College freshman students were used-one group who took reading and the other who did not. The group who took reading received systematic training in the improvement of basic reading skills for one academic semester. In addition, the analysis of the relationship inherent in the oral and silent reading abilities of the two groups was restricted to their performances on standardized tests and observations of eye-movement patterns in silent reading. The fact that the comparison of oral and silent reading performances was limited to certain specific aspects of the two processes; namely, accuracy as it related to the readers ability to pronounce words correctly, rate, comprehension, and eye-movement patterns in silent reading, constituted another limitation of this study. At the time of this study the Reading Eye which was used in photographing and interpreting the eye-movement patterns of the two groups had not been standardized; however, standardization procedures were under way and did include the eye-movement patterns of some students from the Atlanta University Center. This study was further limited in this respect by the fact that the selections read by the subjects during the photographing of their eye-movements were brief.

Summary of Review of Related Literature.--The research findings and opinions of noted authorities in the field of reading presented included information concerning the place and value of oral and silent reading in the school program, studies of good and poor readers, rate

of reading, eye-movement patterns in reading, and comprehension in reading.

The literature surveyed relative to the place and value of oral and silent reading in the school program revealed that there has been much diversity among authorities as to the amount of emphasis which should be placed upon both reading processes in the school program since colonial times. Even though authorities have advanced numerous criticisms against too much emphasis upon oral reading in the school program, many of them do agree that the values of oral reading do warrant a place for it in the school program today. It is further agreed by most authorities that although the heaviest emphasis should be placed upon silent reading in the school program, over emphasis upon any one process may have detrimental effects upon the reader.

The research findings pertaining to good and poor readers indicated that many factors are responsible for a reader's being rated good or poor, and evidence appears to indicate that good readers are not uniformly efficient in all reading skills. Likewise, poor readers do not appear to rate the same in all reading skills.

It was also revealed in the literature surveyed that the rate at which one reads depends upon variety of factors. The purpose for which one reads and the type of material read have much to do with rate of reading. Research findings further indicated that students, whether good or poor readers, may be found to vary considerably in reading rate; and, in many instances, most people maintain a constant rate regardless of its efficiency.

The manner in which the eyes move across the printed page during the reading process is another important factor in both reading processes as revealed by the literature. The number of fixations per line, duration of fixations, and regressions are important aspects of the eye-movement habits of good readers. Some authorities have found the eye-movement habits of good readers to be definitely better than the eye-movement habits of poor readers, while other authorities have found that there are significant individual differences in the eye-movements of readers; and, that the purpose for which one reads has much to do with the character of the eye-movement habits.

Authorities agree that the ultimate goal of reading, oral and/or silent, is the comprehension of ideas. Therefore, eye-movement habits, vocabulary development, rate of reading, background of experience, and intellectual ability are factors which influence the degree of comprehension one attains while reading.

As a result of the literature reviewed it was revealed that, in general, authorities agree that there is a positive relationship between oral and silent reading. However, there is much diversity among them as to the extent of this relationship as indicated in the findings cited by authorities relative to those aspects of oral and silent reading treated in this study.

Summary of Findings.--In accordance with the purposes of this study the following represents a summary of findings which resulted from an analysis and interpretation of the data presented in Chapter II. The general and specific levels of achievement and differences on tests of oral and silent reading abilities and eye-movement measures in silent

reading may be summarized as follows:

1. The statistical computations for Group A in general silent reading ability resulted in a median of 175.5, and a mean of 174.7. The group's distribution of scores was slightly skewed in a negative direction, and their average silent reading grade level was slightly above the college freshman level. Group B's median score was 144.5 and the mean, 144.2. This group's distribution of scores tended to approach normality, and their average silent reading grade level was equivalent to that of one reading on the seventh grade level.

   The difference between the means of the two groups was 30.5, and the "t" test of this difference yielded a score of 14.24 which was significant at the .05 level of confidence.

2. In respect to levels of general oral reading ability, Group A had a median score of 68.5 and a mean score of 67.8. The distribution of scores for this group was skewed in a negative direction, and their average oral reading grade level was above the 9.8 reading grade level. Similarly, Group B's median score was 53.5 and the mean 51.2. Their distribution of scores was also skewed in a negative direction. In terms of average oral reading grade level, they were found to be reading orally below the 9.8 grade level.

   The difference between the means of the two groups was 16.6, and the "t" test of the difference between means was 11.01. This obtained difference was significant at the .05 level of confidence.

3. The data relative to the groups' achievement in oral reading comprehension resulted in a median score of 46.2 and a mean score of 45.8 for Group A. The group's distribution of scores was skewed in a negative direction. Group B had a median score of 37.5 and a mean score of 36.8, with their distribution of scores being skewed in a negative direction also.

   A score of 9.0 was obtained as indicative of the difference between the means of the two groups. The "t" test of the difference between the means gave a score of 7.99 which was significant at the .05 level of confidence.

4. The statistical computations for Group A in silent reading comprehension resulted in a median of 183.5 and a mean score of 182. This group's distribution of scores was negatively skewed. Group B's median score was found to be 158 and the mean 158.4. Their scores tended to approach normality.

   The difference between the means of the groups was 23.6. A score of 7.34 was obtained from computing a "t" test of

the difference between means which was significant at the .05 level of confidence.

5. The results of the groups' performances in the area of oral reading rate gave a median score of 145 and a mean of 145.5 for Group A. This group's distribution of scores was slightly skewed in a positive direction. Group B's median score was 144.5 and the mean, 143. The data revealed that their distribution of scores was skewed in a negative direction.

   A score of 2.5 was obtained as indicative of the difference between the means of Groups A and B. The "t" score of the difference between means was .39, which was not significant at the .05 level of confidence.

6. In the area of silent reading rate the median for Group A was 185.8 and the mean score was 187. The scores for this group were skewed in a positive direction. Group B had a median score of 175.6 and a mean of 180. Their scores were also skewed in a positive direction.

   The difference between the means of the groups was 7, and the "t" test of this difference yielded a score of 1.22; therefore, the difference between the means of the groups was not significant at the .05 level of confidence.

7. The statistical computations for Group A with respect to the number of fixations made during silent reading resulted in a median score of 80.1 and a mean of 81.5. Their scores were skewed in a positive direction, and their average fixational level was well above the college freshman level. Group B's median score was 88 and the mean score was 90.7. This group's distribution of scores was also skewed in a positive direction, and their average fixational level was almost at the college level.

   A score of 9.2 was obtained as being the difference between the means of the groups. The "t" test of the difference between the means was 2.124 which was significant at the .05 level of confidence.

8. The data relative to the groups' achievement in terms of the number of regressions made during silent reading resulted in a median score of 9.2 and a mean score of 8.8 for Group A. Their distribution of scores were skewed in a negative direction, and their average regression level was well above the college level. Similarly, Group B's median score was 16.3 and the mean was 16.2. This group's scores were slightly skewed in a negative direction, and their average regression level was at approximately the 12.5 level.

   The difference between the means of the two groups was 7.4. A score of 4.17 was obtained as indicative of the "t" test

of the difference between means. Therefore, this obtained difference was significant at the .05 level of confidence.

9. With respect to average span of recognition during silent reading, Group A's median score was 1.25 and the mean score was 1.28. Their distribution of scores was positively skewed, and the average level of span of recognition was well above the college level. The median for Group B was 1.14 and the mean was 1.13. This group's distribution of scores was negatively skewed, and their average level of span of recognition was slightly above the college level.

   The difference between the means of the groups was .15, and the "t" test of this difference yielded a score of 2.31. Therefore, this obtained difference was significant at the .05 level of confidence.

10. The results of the two groups' performances with respect to the average duration of fixations during silent reading revealed a median score of .34 and a mean of .35 for Group A. Their scores were skewed in a positive direction, and the average duration of fixation level was well below the first grade level. Group B had a median score of .36 and a mean of .37. This group's distribution of scores was also skewed in a positive direction, and their average duration of fixation level was also well below the first grade level.

    A score of .02 was obtained as being indicative of the difference between the means. The "t" score of the difference between means was 1.52 which was not significant at the .05 level of confidence.

11. The levels of achievement attained by the groups in comprehension during eye-movement photography resulted in a median score of 72.8 and a mean of 74 for Group A. The data further revealed that this group's distribution of scores was positively skewed. The median and mean scores for Group B were 80.8 and 78.5, respectively. Their scores were skewed in a negative direction.

    The difference between the means of the two groups was 4.5, and the "t" test of this difference gave a score of .91. Therefore, this difference between the means of Groups A and B was not significant at the .05 level of confidence.

12. The data pertaining to the groups' performances in the area of silent reading rate during the eye-movement photography resulted in a median score of 196.5 and a mean of 201.5 for Group A. This group's distribution of scores was positively skewed. Group B's median score was 182.5 and the mean was 181. Their scores were skewed in a negative direction.

The difference between the means of Groups A and B was 20, and the "t" test of the difference between the means gave a score of 1.29. Therefore, this obtained difference was not significant at the .05 level of confidence.

The measures of relationships between the groups' oral and silent reading components are summarized here.

1. The data relative to the relationship which existed between Group A's general oral and silent reading abilities resulted in an "r" of .28. When this value was checked in a table of probability with 18 degrees of freedom, it was found to be far below the required "r" of .444 at the .05 level of confidence. The obtained "r" for Group B with respect to these abilities was .48. When this value was checked for significance it was found to be slightly above the required "r" at this level.

2. When the oral and silent reading comprehension scores of the groups were related an "r" of -.83 was obtained for Group A, and an "r" of -.15 for Group B. A check for the significance of these two coefficients revealed that Group A's "r" was far above the required "r" of .444 and the "r" for Group B was far below.

3. The measures of the relationship existing between the groups' oral and silent reading rates gave an "r" of .02 for Group A and an "r" of -.11 for Group B. When these two values were checked in a table of probability with 18 degrees of freedom, both were found to be far below the required "r" of .444 for significance at the .05 level of confidence.

The differences between the relationships of the groups are given here.

1. The fact that for Group A the correlation between general oral and silent reading ability was not significant at the .05 level of confidence, and for Group A it was significant warranted the conclusion that there was a significant statistical difference between these respective relationships of the good and poor readers.

2. With respect to correlations of oral and silent reading comprehension of the groups, the "r" for Group A was above the required "r" for significance and the "r" for Group B was far below. Therefore, it was concluded that there was a significant statistical difference between the respective relationships of oral and silent reading comprehension.

3. Both groups' coefficients of correlation between oral and silent reading rates were far below the "r" required at the

.05 level of confidence. Consequently, the conclusion drawn was that there was no statistically significant difference in the respective relationships of oral and silent reading rates.

Conclusions.--The following conclusions were drawn on the basis of the findings.

1. The data relative to the two groups' performances in general silent and oral reading ability warranted the conclusion that the group of good readers was definitely better than the group of poor readers in these general reading abilities.

2. With respect to oral and silent reading comprehension, the findings led to the conclusion that the group of good readers attained a significantly higher level of achievement than the group of poor readers.

3. Although there was some numerical differences between the oral and silent reading rates of the two groups, the statistical findings resulted in the conclusion that there was no significant difference between these aspects of oral and silent reading abilities of the two groups. The good group of readers and the poor group of readers appeared to read at about the same rates orally and silently.

4. The results from the data relative to the groups' eye-movements during silent reading led to the conclusion that the group of good readers definitely made fewer fixations and regressions than the group of poor readers during silent reading; also, the group of good reader's average span of recognition in silent reading was significantly larger than the poor readers.

5. The eye-movement data further warranted the conclusion that there was no significant difference between either groups' average duration of fixations, comprehension levels and rates of reading during silent reading.

6. The results of the measures of relationships led to the conclusion that those students who scored high on a test of general silent reading ability will not necessarily perform at a similar level of proficiency in oral reading ability; and, students who perform at a low level on one test of general silent reading ability also tend to perform at a similar level on tests of oral reading ability.

7. The inverse relationship which existed between the group of good readers' oral and silent reading comprehension indicated that this group was more nearly paralleling a general trend for better readers to gain a much higher level of understanding

in silent than in oral reading performances. For Group B there was no appreciable pattern of relationship and, hence, it was concluded that these poorer readers did not appear to be approximating that trend, but rather showed no correspondence between oral and silent reading comprehension.

8. The results of the measures of relationship relative to Group A's oral and silent reading rate appeared to justify the conclusion that the rate at which they read silently did not seem to influence the rate at which they read orally. There appeared to be no systematic relationship between the two variables. Likewise, the low inverse relationship obtained for Group B resulted in the conclusion that the rate at which they read silently did not influence the rate at which they read orally.

9. The differences found between the respective group relationships in general silent and oral reading led to the conclusion that there appeared to be a statistically stronger relationship between the poor readers' scores than for those of the good readers.

10. The data concerning the differences between the respective group relationships in oral and silent reading comprehension seemingly warranted the conclusion that among the better readers, high, average and low silent reading comprehension scores tended to accompany correspondingly opposite rating in oral reading, while no specific pattern obtained for the less effective readers.

11. With respect to the differences between the oral and silent reading rate relationships, the findings appeared to justify the conclusion that, although there was some numerical difference between the relationships, the difference between the good and poor groups of readers showed no appreciable tendency for either set of scores to vary similarly or in reverse positions.

Implications.—The educational implications drawn from the findings and which are applicable only to this situation are as follows:

1. The general oral and silent reading and oral and silent comprehension levels attained by the group of good readers implied that, generally, these students could deal satisfactorily with reading materials designed for the college level; whereas, the levels of achievement attained by the poor readers in these areas implicated that at their present reading grade levels difficulties would be encountered in reading materials on the college level.

2. Both groups' performances relative to silent and oral reading rates could serve as a basis for increased stress in rate of reading.

3. The results of this study appeared to agree with the opinions of many authorities in the field that good readers are not uniformly efficient in all reading skills and poor readers do not rate the same in all skills.

4. The findings and conclusions also indicated that both groups appear to need help in the improvement of or compensation for duration of fixations; however, most authorities suggest that duration is least amenable to change.

5. The good readers reflect the significant fact that higher levels of silent reading performance do not necessarily have accompanying levels of oral reading performances.

Recommendations.--The following recommendations are given on the basis of the findings, conclusions and implications:

1. The group of good readers should be encouraged and aided in the further development and enrichment of those reading skills wherein relatively high levels of achievement have already been attained so that even higher levels of reading proficiency may be reached in accordance with their abilities.

2. The group of poor readers who show promise of improvement should receive additional systematic training and help in a reading laboratory or clinic in the development of these reading skills in an effort to bring them up to the college reading level and/or in accordance with their potentialities to learn.

3. Both groups of readers-good and poor-should be given help in improving reading rates without loss of comprehension and in learning how to differentiate their rates of reading according to the purposes for reading and difficulty of the material to be read.

4. At higher educational levels some attention should be given to maintaining proficiency in oral reading, not necessarily through specific training, but through situations which require its effective use.

Recommendations for Further Study.--As a result of this study the following recommendations for further study are given:

1. There should be a study done relative to these aspects of reading using more extreme groups of readers in order to

compare the results obtained.

2. A study of this nature should be done under circumstances where data relative to eye-movements during oral reading can be obtained.

3. An experimental study is recommended wherein a group's oral and silent reading abilities are assessed before and after the period of instruction and then compared.

BIBLIOGRAPHY

Books

Anderson, I. H., and Dearborn, W. F. The Psychology of Teaching Reading. New York: The Ronald Press Co., 1952.

Betts, Emmett A. Foundations of Reading Instruction. New York: American Book Co., 1946.

Buswell, Guy T. Fundamental Reading Habits: A Study of Their Development. Chicago: University of Chicago Press, 1922.

Cole, Luella. The Improvement of Reading. New York: Farrar & Rinehart, Inc., 1938.

Gates, Arthur I. The Improvement of Reading. New York: The Macmillan Co., 1928.

Guilford, J. P. Fundamentals of Statistics in Psychology and Education. New York: McGraw-Hill Book Co., 1954.

Harris, Albert J. How to Increase Reading Ability. New York: Longans, Green & Co., 1956.

Hildreth, Gertrude. Teaching Reading. New York: Henry Holt & Co., 1958.

Hillway, Tyrus. Introduction to Research. Boston: Houghton Mifflin Co., 1956.

McKee, Paul. The Teaching of Reading in the Elementary School. Boston: Houghton Mifflin Co., 1948.

Robinson, Helen M. Why Pupils Fail in Reading. Chicago: The University of Chicago Press, 1946.

Stone, Clarence. Silent and Oral Reading. Boston: Houghton Mifflin Co., 1937.

Strang, Ruth, and Bracken, Dorothy K. Making Better Readers. Boston: D. C. Heath & Co., 1957.

Tinker, Miles A. Teaching Elementary Reading. New York: Appleton-Century-Crofts, Inc., 1952.

Triggs, Francis O. Remedial Reading: The Diagnosis and Correction of Reading Difficulties at the College Level. Minneapolis: The University of Minnesota Press, 1943.

Witty, Paul. Reading in Modern Education. Boston: D. C. Heath & Co., 1949.

Periodicals

Bayle, Evalyn. "The Nature and Causes of Regressive Movements in Reading," Journal of Experimental Education, XI (September, 1942), 16-36.

Bliesmer, Emery P. "Reading Abilities of Bright and Dull Children of Comparable Mental Ages," Journal of Educational Psychology, XLV, No. 6 (October, 1954), 321-331.

Bloomers, Paul, and Lindquist, E. F. "Role of Comprehension of Reading: Its Measurement and Its Relation to Reading," Journal of Educational Psychology, XXXV (November, 1944), 449-73.

Burns, Kenneth. "Methods for Improving Oral Expression in Grades 10-14," Oral Aspects of Reading. Edited by H. M. Robinson. Supplementary Educational Monographs, No. 82 (December, 1955), 47-50.

Buswell, G. T. "Non-Oral Reading," Education Digest, XI (December, 1945), 17-19.

Carrilla, L. W., and Sheldon, William D. "The Flexibility of Reading Rate," Journal of Educational Psychology, XLIII (May, 1952), 299-305.

Casper, Russell, and Mills, Barris. "Reading Comprehension and Speed," School and Society, LXVII (June, 1953), 359-62.

Courtney, Leonard. "Developing Understanding and Skills in Word Recognition in Grades 10-14," Oral Aspects of Reading. Edited by H. M. Robinson. Supplementary Educational Monographs, No. 82 (December, 1955), 67-70.

Dixon, Marion. "Methods for Improving Appreciation of Materials Presented Orally in Grades 10-14," Oral Aspects of Reading. Edited by H. M. Robinson. Supplementary Educational Monographs, No. 82 (December, 1955), 121-24.

Dolch, E. W. "Diagnosis and Remediation of Disability in Oral Reading," Oral Aspects of Reading. Edited by H. M. Robinson. Supplementary Educational Monographs, No. 82 (December, 1955), 91-95.

Eurich, Alvin C. "The Relation of Speed of Reading to Comprehension," Oral Aspects of Reading. Edited by H. M. Robinson. Supplementary Educational Monographs, No. 82 (December, 1955), 404-06.

Gray, W. S. "Characteristics of Effective Oral Reading," Oral Aspects of Reading. Edited by H. M. Robinson. Supplementary Educational Monographs, No. 82 (December, 1955), 5-10.

Helmkamp, Eunice. "Classroom Procedures in Improving All Aspects of Oral Reading in Grades 10-14," Oral Aspects of Reading. Edited by H. M. Robinson. Supplementary Educational Monographs, No 82 (December, 1955), 87-90.

Horn, Ernest, and Curtis, James F. "The Improvement of Oral Reading," The 48th Yearbook of the National Society for the Study of Education. Part II. Chicago: University of Chicago Press, 1949, 254-65.

Karp, Mary. "Silent Before Oral Reading," Elementary School Journal, XLIV (October, 1943), 102-04.

Laycock, Frank. "Significant Characteristics of College Students with Varying Flexibility in Reading Rate: Eye-Movements in Reading Prose," Journal of Experimental Education, XXIII (June, 1955), 311-19.

Preston, R. C., and Tuft, E. N. "Reading Habits of Superior College Students," Journal of Experimental Education, XVI (March, 1948), 196-201.

Price, Helen, and Stroud, J. B. "A Note on Oral Reading," Education Digest, XI (December, 1945), 20-22.

Reed, J. C., and Pepper, R. S. "Interrelationships of Vocabulary, Comprehension and Rate Among Disabled Readers," Journal of Experimental Education, XXV (June, 1957), 331-37.

Schubert, D. G. "Comparison Between Best and Poorest Classroom Readers," Elementary English Journal, XXXIII (March, 1956), 161-62.

Seibert, Earl W. "Reading Reactions for Varied Types of Subject Matter," Journal of Experimental Education, XII (September, 1943), 37-44.

Shane, Harold G. "The Expanding Role of Oral Reading in School and Life Activities," Oral Aspects of Reading. Edited by H. M. Robinson. Supplementary Educational Monographs, No. 82 (December, 1955), 1-4.

Simpson, Elizabeth A. "Reading Rate and Its Relationship to Good Reading," Education, LXX (May, 1950), 565-69.

Simpson, R. G. "The Relationship of Certain Functions to Eye-Movement Habits," Journal of Educational Psychology, XXXIII (May, 1942), 373-78.

Smith, N. B. "Relative Emphasis on Oral and Silent Reading in the School Program," Oral Aspects of Reading. Edited by H. M. Robinson. Supplementary Educational Monographs, No 82 (December, 1955), 71-76.

Spache, George D. "What's Wrong with our Teaching of Reading," Journal of Education, CXXXVIII (1955-56), 19-27.

Tinker, Miles A. "Time Relations for Eye-Movement Measures in Reading," Journal of Educational Psychology, XXXVIII, No. 1 (January, 1947), 1-10.

Triggs, F. O. "Reading at the College Level: Present Status of Developmental and Remedial Reading Programs at the College Level," Journal of Higher Education, XX (February, 1949), 65-70.

Wheeler, L. R., and Wheeler, V. D. "Improving Rate of Comprehension," High School Journal, XXXIX (October, 1955), 53-58.

Whipple, Gertrude. "Stimulating and Directing the Development of a Sound Oral Reading Program," Oral Aspects of Reading. Edited by H. M. Robinson. Supplementary Educational Monographs, No. 82 (December, 1955), 142-46.

Tests

Gilmore, John V. Gilmore Oral Reading Test. New York: World Book Co., 1952.

Greene, H. A., Jorgensen, A. N., and Kelley, V. H. Iowa Silent Reading Tests. New York: World Book Co., 1943.

Taylor, Stanford E. Eye-Movement Photography with the Reading Eye. New York: Educational Developmental Laboratories, Inc., 1959.

VITA

Fields, Ruth Patricia

Education: B. A., Clark College, (Elementary Education), 1958; M. A. Atlanta University, 1960. Thesis Topic: Comparisons and Relationships of Oral and Silent Reading Performances of Good and Poor College Freshman Readers.

Experience: Graduate Assistant in Reading, Clark-Morehouse-Morris Brown-Spelman Cooperative Experimental Summer School Program, Summer, 1959; Graduate Assistant in Reading, Clark College, 1958-60.

Fields of Concentration: Undergraduate, Elementary Education; Graduate, Education with special preparation in reading.

Personal Information: Single. Recipient, Reading Fellowship, Lilly Endowment, Inc., 1958-60.

APPENDIX

Gilmore Oral Reading Test FORM A

by John V. Gilmore
Associate Professor of Psychology
Boston University

RECORD BLANK

NAME_____ DATE_____ GRADE_____

SCHOOL_____ AGE_____ (YEARS / MONTHS) SEX_____

CITY_____ STATE_____ EXAMINER_____

Summary Check List of Difficulties

From an analysis of the pupil's oral reading performance, complete the check list below.

____ Many substitutions
____ Habitual mispronunciations
____ Many words pronounced by examiner
____ Habitual disregard of punctuation
____ Habitual insertions
____ Habitual hesitations
____ Habitual repetitions
____ Habitual omissions
____
____
____
____

Check the following immediately after completion of the testing:

____ Word-by-word reading
____ Reads in monotone
____ Strained, high-pitched voice
____ Volume too loud
____ Volume too soft
____ Poor enunciation

Comments:_____

Test Summary

PARAGRAPH	ACCURACY: ERRORS	ACCURACY: 10 MINUS NO. ERRORS	COMPREHENSION: NO. RIGHT (OR CREDITED)	RATE: WORDS IN ¶	RATE: TIME IN SEC.
1				26	
2				50	
3				51	
4				68	
5				107	
6				107	
7				126	
8				147	
9				184	
10				252	
	ACC. SCORE (TOT. "10 MINUS NO. ERRORS" COLUMN)		COMP. SCORE (TOT. NO. RIGHT OR CREDITED)	(1) NO. WORDS READ*	
				(2) TIME IN SEC.*	
				(1) ÷ (2)	×60
GRADE EQUIV.				RATE SCORE (WPM)	
RATING					

*Do *not* count "ceiling" paragraph or paragraphs below "basal."

Silent Reading Test Data DATE_____
TEST_____
WORD MEAN. (VOCAB.) GRADE EQUIV._____
PARA. MEAN. (READ.) GRADE EQUIV._____
AVE. READ. GRADE EQUIV._____

Published 1952 by World Book Company, Yonkers-on-Hudson, New York, and Chicago, Illinois

a

PRINTED IN U.S.A. G : OBT : RB : A–10

1. I see a boy.
He has a dog.
Here is a girl.
I see a cat, too.
The man is Father.
Mother is in the house.

TIME _____Seconds

__1. What animal is the boy playing with?
__2. What other animal is there?
__3. Who is the man?
__4. Where is Mother?
__5. Whom else do you see?

NUMBER RIGHT _____

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

2. The girl is in the yard.
The girl has a big ball.
The boy is back of the girl.
He is playing with his dog.
The cat looks at the girl.
He wants to play ball, too.
The girl does not see the cat.
She is looking at the ball.

TIME _____Seconds

__1. Where is the girl?
__2. What does the girl have?
__3. What is the boy doing?
__4. What does the cat want?
__5. What is the girl looking at?

NUMBER RIGHT _____

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

5. Every morning Father goes to his office by train. He usually leaves the house about eight o'clock. In rainy weather Mother drives him to the station. When the train reaches the city at eight forty-five, Father goes to the general offices of his company. An elevator carries him to the eleventh floor. His important position takes hours of extra time, and many evenings he doesn't arrive home until late. Bob and Jane are disappointed when he works at night, for he frequently assists them with their lessons. Then, too, if there is time after dinner for games, he often plays with them before they begin to study.

TIME _____Seconds

__1. What time does Father leave the house in the morning?
__2. What does Mother do for Father when it is raining?
__3. On what floor is Father's office?
__4. How does Father help Bob and Jane when he is home evenings?
__5. When does Father play games with them?

NUMBER RIGHT _____

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

6. Nearly every family living in the city suburbs takes a vacation sometime during the summer. When the weather becomes warm, usually during July, Bob and Jane accompany their parents to the seaside. In order to reach their destination on the shore, they are obliged to travel over a mountain range. If they begin their journey before sunrise the first day, they can see many impressive scenes in the mountains. The exciting but lengthy trip requires two full days. While at the beach Bob and Jane spend many blissful hours bathing in the surf and relaxing on the sunny sand. Summer vacations help Bob and Jane keep healthy.

TIME _____Seconds

__1. What does almost every city family do in summer?
__2. What month do Bob and Jane usually go to the seashore with their parents?
__3. What must they do to reach the shore?
__4. How long is their trip?
__5. How do summer vacations help Bob and Jane?

NUMBER RIGHT _____

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

3. The name of the boy is Bob.
The name of his sister is Jane.
They live with their parents
in a white house near the city.
They are playing on the walk.
The dog and cat are their pets.
After Father has gone to work,
the children will leave for school.

TIME _____Seconds

__1. What is the boy's name?
__2. What is his sister's name?
__3. Where is their house?
__4. What are their pets?
__5. When will the children leave for school?

NUMBER RIGHT _____

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

4. Mother waves good-by to Father each morning. She begins the housework soon after he leaves. Bob and Jane help her before they go to school. They dry the dishes and clean their own rooms. After Mother has finished the work indoors, she goes out to her pretty flower garden. She tends it nearly every day for about an hour. Mother does all her work with great care.

TIME _____Seconds

__1. What does Mother do as Father is leaving?
__2. What does Mother do after Father has gone?
__3. When do Bob and Jane help Mother?
__4. Where does Mother go after she has finished the work indoors?
__5. How long does she work in her garden each day?

NUMBER RIGHT _____

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

7. After their restful and refreshing vacation is over, Bob and Jane feel quite adequately prepared for school. When they return from their sojourn at the seashore, they are overjoyed to play with their pets once again. Their parents are delighted to see them tanned and healthy. School opens within a few weeks after they return home, and during August their mother helps them acquire the new clothing and equipment which they will need later. Each year the beginning of school in early September brings a stimulating program of very challenging studies. Bob's favorite subject will undoubtedly be sixth-grade science, while Jane, entering the fourth grade, will enjoy reading. In addition to schoolwork, both will take music lessons. Jane studies the violin, but Bob prefers the trumpet.

TIME _____Seconds

__1. What do Bob and Jane play with when they return from their vacation?
__2. In what month does their mother help them buy their clothing and school equipment?
__3. What grade will Bob be in?
__4. What subject will Jane like?
__5. What musical instrument does Bob play?

NUMBER RIGHT _____

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

8. Mother and Father are proudly making ambitious plans for the future education of their children, Bob and Jane. They realize that several factors are going to play a part in the ultimate selection of their careers. First of all, the children must be physically and mentally equipped for the professions of their choice. The financial cost of the necessary training program must also be considered, while a third factor is the attitude of relatives and friends. Obviously, Bob and Jane are not yet able to make a final choice. Parents often entertain secret ambitions for their children, and Mother and Father hope that Bob and Jane will enter some branch of medicine. They visualize Bob in surgery; however, at present he is fascinated by aviation. Although Jane has always aspired to be a kindergarten teacher, her family thinks that she is ideally suited for the nursing profession.

TIME _____Seconds

__1. What are Mother and Father planning for?
__2. What profession do they hope Bob and Jane will choose?
__3. What branch of this profession would they like Bob to enter?
__4. What interests Bob at the present time?
__5. What has Jane always wanted to be?

NUMBER RIGHT _____

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

9. Although Bob and Jane now think they will eventually comply with their parents' wishes in choosing medicine as their profession, a recent school incident indicates that their interests may later turn more in the direction of an intensive study of the human mind. One day, while discussing with their science instructor the differences between human beings and animals, they discovered that human mentality differs chiefly from animal mentality in being essentially preoccupied with symbols. They realized, for the first time, that they themselves were employing symbols. They learned that a symbol is a sign or word which refers to something, such as an object, a person, or a concept, and that nearly all knowledge is a product of symbolic expression. They discovered that symbols are used in languages, mathematics, and music; and they learned that even the flag is a symbolic emblem of patriotism. Thus, Bob and Jane are beginning to realize that the mind of man, which deals pre-eminently with these symbols, is a significant study in itself. They recognize the truth inherent in the adage, "The proper study of mankind is man."

TIME _____Seconds

__1. What study may later become of absorbing interest to Bob and Jane?
__2. With whom were Bob and Jane talking when they were comparing human beings and animals?
__3. How does the human mind differ from that of an animal?
__4. What emblem signifies love of country?
__5. What is the saying of which Bob and Jane now recognize the truth?

NUMBER RIGHT _____

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

10. When Bob and Jane study psychology in college, they will further penetrate the intricacies of the human mind. Learning that the mind and the emotions are closely interrelated, they will discover that virtually all problems which cause disturbance to an individual are associated in some degree with his emotional life. A person's "emotional adjustment" not only affects his own happiness and equilibrium, but also has a profound influence on his associates; thus it is axiomatic that emotions are a fundamental consideration in all human relationships. Psychology has proved conclusively that harmony or discord among persons, far from occurring fortuitously, can be explained by the same principle of cause and effect which operates in other fields of science. There appear to be two general causes of group tensions: the first is genetic in character; and the second, related to the cultural milieu in which we live. Scholars in various areas of study, among whom we find anthropologists, sociologists, and statisticians, have joined the psychologist in assiduous investigations in this complex field. The problems of human relations which confront our present-day society are both baffling and challenging; as intelligent citizens we can and should contribute to their ultimate solution by trying conscientiously to understand our own behavior. Such injunctions as "Don't take yourself too seriously" have in the past been fashionable attempts at disposing of personal problems. However, they are little more than avoidance mechanisms which ignore the real causes of behavior; in light of current psychology they may in fact be considered anachronistic.

TIME _____Seconds

__1. In what college course will Bob and Jane study about the mind?
__2. What factor affects the happiness of every individual?
__3. According to modern psychology, what scientific principle explains relationships among people?
__4. Name one field besides psychology in which scholars are studying the problems of human relations.
__5. What can each individual do to help in the solution of these problems?

NUMBER RIGHT _____

ERROR RECORD	Number
Substitutions	
Mispronunciations	
Words pronounced by examiner	
Disregard of punctuation	
Insertions	
Hesitations	
Repetitions	
Omissions	
Total Errors	

IOWA SILENT READING TESTS

NEW EDITION

Median Score	
Grade Percentile	
Grade Equiv.	
Age Equiv.	

By H. A. GREENE
Director, Bureau of Educational Research and Service, University of Iowa
A. N. JORGENSEN
President, University of Connecticut
and V. H. KELLEY
University Appointment Office, University of Arizona, Tucson, Arizona

ADVANCED TEST : FORM BM
(*Revised*)

Name..... Age..... Grade.....
Years Months

Sex..... Date.....19.... Teacher.....
Boy Girl

School..... City and state.....

No.	Test	Stand. Score
1	Rate: A + B	
	Comprehension: A + B	
2	Directed Reading	
3	Poetry Comprehension	
4	Word Meaning	
5	Sentence Meaning	
6	Paragraph Comprehension	
7	Location of Information A. Use of Index	
	B. Selection of Key Words	

PROFILE CHART

Score Scale	TEST 1R	1C	2	3	4	5	6	7A	7B	Median Score
230										
220										
210										
200										
190										
180										
170										
160										
150										
140										
130										
120										
110										
100										

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Edition b

TEST 1. RATE–COMPREHENSION — PART A

DIRECTIONS. This is a test to see how well and how rapidly you can read silently. Read the story below very carefully so that you can answer questions about it.

At the end of *one minute* you will hear the word "Stop." Put a circle around the word you are then reading and wait for further instructions.

RUBBER

[1] Rubber is a substance composed of carbon and hydrogen, obtained from a milky liquid known as latex. [2] Latex comes from the roots, stems, branches, leaves, and fruit of a wide variety of trees. [3] For the most part these trees grow in the tropics. [4] The milky juice is not the true sap, but a secretion which does not seem to be essential to the life of the plant. [5] If this liquid is allowed to stand for a few hours, the particles of rubber rise to the surface. [6] The doughy mass thus obtained can easily be rolled into a sheet or other convenient form. [7] When allowed to dry, it loses its doughy character and becomes the firm, elastic solid known as raw or crude rubber.

[8] In whatever form the crude rubber comes to the factory, the first thing that must be done is to clean it thoroughly and test it, as rubber varies greatly in composition. [9] Until it is used it is stored in a cool, dark place, usually underground. [10] When a load is brought to the manufacturing plant, the first step is to steam it into a soft, plastic mass. [11] It is then thoroughly washed by being passed through heavy rollers while water is sprinkled on from above. [12] Finally it comes out looking like a thin piece of sheet sponge. [13] Vacuum driers take this spongy sheet and extract every particle of moisture.

[14] Next it is put into mills which rub and crush it until it loses its elasticity and becomes soft and plastic like putty. [15] In this form it is ready for the mixing room, where sulphur and other ingredients are added to it. [16] Each rubber product has a special requirement which must be taken into account in the preparation. [17] For some articles the substance must be hard, for others soft; some must stand abrasion, others heat. [18] Some will come in contact with acid, others must stand continuous pounding, and still others a steady pressure. [19] Each ingredient is weighed with painstaking care. [20] Then the mixture is rolled between hot rollers, from which it emerges a sheet of prepared rubber about a quarter of an inch in thickness.

[21] The rubber is then ready for the products factory. [22] After the articles have been fashioned, they are vulcanized. [23] That is, the rubber is cured by the use of heat. [24] The hardness of the article is determined by the amount of heat and the length of time it is applied.

Wait for further directions. Do not answer any of the questions until you are told to do so.

◀2

SAMPLE. How is rubber obtained?
1 from a mine 2 from a tree 3 from a chemical laboratory

1. What is meant by the vulcanization process?
1 adding chemicals 2 purifying the rubber 3 curing by heat 1

2. What is the name of the liquid from which rubber is made?
1 sap 2 latex 3 secretion 2

3. How are the particles of rubber separated from the liquid?
1 by allowing it to stand 2 by stirring it 3 by heating it 3

4. The rubber is tested when it first comes to the factory to determine its —
1 composition 2 moisture content 3 elasticity 4

5. What is used to cleanse the rubber at the factory?
1 hot oil 2 fresh water 3 strong acid 5

6. Special chemicals are added to the rubber in the mixing room —
1 to dry it 2 to purify it 3 to vary the quality 6

7. What name is given to the elastic substance when it first comes to the factory?
1 dough 2 crude rubber 3 elastic 7

8. Manufactured rubber articles are first fashioned in the —
1 mixing room 2 rubber mill 3 products factory 8

9. What determines the kind and amount of the ingredients which are added to the rubber in the mixing room?
1 ultimate use of article 2 moisture content 3 purity of sample 9

10. When ready for the mixing room, the rubber is in the form of — ◀
1 an elastic solid 2 a soft, plastic mass 3 sheet sponge 10

TEST 1. RATE–COMPREHENSION — PART B

DIRECTIONS. Read this story very carefully so that you can answer questions about it. When you hear the word "Stop," put a circle around the word you are then reading and wait for further instructions.

THE INFLUENCE OF THE PRESS

[1] The policy of the government in a democracy is decided in the long run by public opinion. [2] The government sometimes takes a position that is unpopular, but it must justify its course in order to hold the support of the majority of the people. [3] If the party in power fails to do this, it will eventually be voted out of office and a party more to the liking of the majority will be set up in its place. [4] The people are the masters, and the greatest problem that confronts the United States is that of making the people fit to exercise their sovereignty.

[5] One of the most important instruments in the formation and expression of public opinion is the printing press. [6] The freedom of the press from interference by the government has been guaranteed in the provisions of the first ten Amendments. [7] It must be admitted, however, that the people, during both the Civil War and the World War, consented to governmental interference with the press in the form of an extensive censorship of the news. [8] At such times the pressure of military necessity creates a situation which would not be tolerated in times of peace. [9] The press itself recognizes that when the very existence of the nation is at stake, it must refrain from publishing information that will aid the enemy or weaken the people's morale.

[10] Undoubtedly the most influential division of the press is the newspaper. [11] The large daily newspaper has correspondents in every part of the world, who telegraph daily accounts of events in their respective territories. [12] Local reporters are also assigned to keep in touch with the many activities of the city, and to write accounts of events that are of interest to the local readers of the paper. [13] In addition to the daily news, many newspapers, especially in their elaborate Sunday editions, conduct departments intended to promote general culture by reviewing new books, scientific discoveries, plays at the local theaters, musical attractions, art exhibits, and many other similar features.

[14] The public is entitled to an account of the events of the world, uncolored by editorial opinion. [15] Too often the news reports are tinged with propaganda either by the insertion of editorial comment in the text of the story or by misleading headlines designed to guide the judgment of the reader. [16] Newspapers with the best of intentions find it impossible always to keep the reporter's natural bias out of his stories.

[17] The editorial columns are the legitimate place for the expression of opinion about the news of the day. [18] To express opinion, to interpret the news by intelligent comment, is the business of the editor. [19] News columns are read to discover the facts and consequently should be unbiased. [20] Editorial columns should be read in much the same way that one might discuss the news with an intelligent neighbor, to test one's opinions and perhaps to modify them, if strong arguments for contrary views are presented. [21] The editorial page should be approached in a critical frame of mind, in which the reader expects to find, not bare facts, but the interpretation of these facts by an individual who is often biased in his judgment.

[22] The business interests of large advertisers often influence the policy of the newspaper. [23] The largest part of the cost of publishing a newspaper is paid by businessmen and corporations using its advertising columns to display their wares. [24] The people who subscribe for the paper pay a very small percentage of the total cost. [25] It is not surprising, then, that some newspapers treat large business interests with more than benevolent neutrality. [26] It is, of course, contrary to public interest to have the organs of public opinion controlled by business interests; for business corporations, like individuals, are likely to take a biased view of questions which might concern their profits.

Wait for further directions. Do not turn this page until you are told to do so.

RATE: A + B	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
Standard Score	79	81	84	88	91	93	95	100	102	105	107	112	115	118	121	127	130	134	137	144	147	151	154	160	163	166	169	172	175	178	181	184	187	189

RATE: A + B	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Standard Score	192	195	197	199	202	203	205	206	209	211	213	216	218	220	222	223	225

TEST 7. LOCATION OF INFORMATION

PART B. SELECTION OF KEY WORDS

DIRECTIONS. This is a test of your ability to choose key words for use in looking up information in an index. Study the sample. Read each question and note that four numbered words or phrases are given below it. Three of these words or phrases would, if looked up in an index, be likely to lead to an answer to the question. One of the numbered parts would *not* help in locating the information. Locate this one word or phrase, *the one that would not help*, and note its number. Then fill in the answer space at the right of the exercise which has the same number as the word or phrase which you chose. The sample is answered correctly.

SAMPLE. What is the value of our annual corn crop?
1 crops 2 wheat 3 corn 4 sweet corn. . . . . .

1. What is the value of our annual supply of mineral products?
1 iron 2 lumber 3 mineral products 4 coal 1
2. What are the main water routes of the United States?
1 canals 2 rivers 3 lakes 4 rainfall 2
3. Was John Hay a joint author of the treaty which defined the use of the Panama Canal?
1 John Hay 2 secretary 3 Panama Canal 4 Hay-Pauncefote Treaty 3
4. Was Pershing commander of the allied armies during the World War?
1 general 2 Pershing 3 World War 4 allied armies 4
5. What is the annual cost of damage done to crops by insects?
1 insects 2 boll weevil 3 wool 4 crops 5
6. Is phosphorus, which is a non-metallic element, a valuable ingredient in tool steel?
1 phosphorus 2 steel 3 tools 4 element 6
7. Was Andrew Mellon the man who formulated the Federal Reserve System and a Federal Income Tax Law?
1 lawmaking 2 Federal Reserve 3 Andrew Mellon 4 income tax 7
8. Was Lloyd George the man who formulated in England the budget system and the tax on unearned increments?
1 Lloyd George 2 system 3 England's unearned increment tax 4 England's budget system 8
9. Why is the name Lenin usually associated with the industrial revolution of Russia?
1 Lenin 2 Russia 3 revolution in Russia 4 history 9
10. What method of learning did Socrates contribute to education?
1 Socrates 2 Socratic method 3 methods 4 education 10

16

11. Has the Republican party generally followed the policy of high protective tariff?
1 revenue 2 Republican 3 tariff 4 party policies 11
12. Was Poe the author of "The Gold Bug"?
1 Poe 2 "Gold Bug" 3 stories 4 American authors 12
13. When was the first transcontinental railroad constructed?
1 Union Pacific 2 Santa Fe 3 railroads 4 steam 13
14. What was the character of the literature during Queen Victoria's reign?
1 character 2 Queen Victoria 3 Victorian period 4 English literature 14
15. Is the name of Hitler usually associated with the revolution in Germany?
1 Hitler 2 associated 3 revolution 4 Germany 15
16. Is malaria carried from one person to another by mosquitoes?
1 disease 2 contagious fevers 3 malaria 4 mosquitoes 16
17. Did the parliamentary system of government originate with Great Britain?
1 parliamentary system 2 constitutions 3 systems 4 Prime Minister 17
18. In what year did the Spanish-American War begin?
1 Spain 2 Spanish-American War 3 United States 4 navy 18
19. Was General Grant in charge of the Union forces when General Lee surrendered at Appomattox?
1 General Grant 2 Appomattox 3 confederates 4 Civil War 19
20. Is agriculture an important industry in Argentina?
1 agriculture 2 industry 3 Argentina 4 farm products 20

Stop here. Wait for further instructions.

NUMBER RIGHT: B	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Standard Score	128	131	134	137	141	145	149	153	156	159	162	165	169	173	176	180	184	189	198	204	210

TEST 1. RATE–COMPREHENSION — PART B (*Cont'd*)

DIRECTIONS. Without looking again at the article, answer these questions. Study these statements carefully. Decide whether, in terms of the article, a statement is true, false, or not discussed. If, according to the article, the statement is true, fill in the answer space under T (for true); if false, fill in the space under F (for false). If a statement is not discussed in the article (even though true or false in itself), fill in the space under N (for not discussed). The sample is answered correctly.

SAMPLE. Public opinion never determines policy in a democratic government. .....

1. In the long run, the political party in power in a democratic nation must express the wishes of the majority. 1
2. The weekly and monthly magazines exert more influence on public opinion than do the daily newspapers. 2
3. Newspaper stories and headlines always tell the truth. 3
4. News reporters write accounts of activities within the community as a means of creating local interest. 4
5. An important instrument in the formation and expression of public opinion is the radio. 5

➔

6. The Twelfth Amendment to the Constitution provides for freedom of the press. 6
7. The policy of the government in a democracy is determined by the attitude of the press. 7
8. The greatest problem that confronts our government today is that of educating the citizens to exercise their sovereignty wisely. 8
9. Freedom of the press is provided for in the Preamble to the Constitution. 9
10. Censorship of the press is enforced in times of great military necessity. 10
11. There are many highly organized agencies for the collection and distribution of news. 11

4➔

12. Editorial interpretation should be emphasized in the news column. 12
13. Weekly summaries of current news are replacing the newspapers in the formation of public opinion. 13
14. The editorial column of a newspaper is the place in which the publisher's opinions and critical interpretation of the news of the day are presented. 14
15. The reader should accept any statement presented in the editorial columns of a newspaper as an unquestionable fact 15
16. The President, as commander-in-chief of the army, may order a newspaper to cease publication. 16
17. Large corporations frequently own large amounts of stock in the companies publishing newspapers. 17
18. The policy of a newspaper is sometimes very definitely influenced by the interests of large advertisers. 18

➔

19. News reporters often refuse to coöperate with government agencies in releasing news of great national importance. 19
20. Newspapers publishing false and libelous stories may be punished by law. 20
21. Newspapers frequently conduct departments intended to stimulate interest in some field of general culture. 21
22. The advertisements in a newspaper are a good index of its policy. 22
23. The price the reader pays for his paper is practically the same as the cost of publication. 23
24. The active control of newspaper policy by big business interests is unfavorable to public welfare. 24
25. Newspaper editors find it easy to keep reporters from coloring their stories with their own personal views. 25

Do not turn this page until you are told to do so.

COMPREHENSION

No. RIGHT: A + B	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Standard Score	103	106	108	112	115	118	122	126	130	135	140	144	151	154	158	161	165	168	171	175	178	181	184	190	193	196	199	203	207	210	214	217	222	225	229	232

TEST 7. LOCATION OF INFORMATION

PART A. USE OF THE INDEX

DIRECTIONS. The answers to the questions in Column 2 are found in the index below. First read the question and then find the desired answer by looking under the proper topic in the index. Then locate your answer among the possible answers given with the question and fill in the answer space in the margin which is numbered the same.

Study the samples carefully before you try to answer the questions.

Look at Sample A. In the index under "Oregon" you will find the word "climate" and the page reference, 335. 335 is third among the answers given with the question; so the third answer space has been filled in.

Look at Sample B. See if you can find the answer in the index. The correct answer space is marked.

Answer the remaining exercises the same way.

INDEX

Africa: climate, 125, 126; exports, 140 (Fig. 90); industries, 130; map, page 119; natural resources, 99, 144; population, 135; waterways, 150.

Chemistry: defined, 90; divisions, 63; industrial uses of, 66–69; in secondary schools, 70; in warfare, 69.

Cotton: by-products of, 480; exports, 489–491; growing of, 473; important districts in United States, 474; manufactures of, 482–489; planting of, 472; value, 492. *See also* Clothing.

England: coal, 372; commerce, 359–361 (Fig. 121); dairying, 155; factory system, 483; iron industry, 355; wool manufacture, 499. *See* Great Britain.

Forests: American destruction of, 419; Great Lakes region, 426; political control, 422; preservation, 421; tropics, 452.

Germany: agriculture, 34–39; army, 40–41; aviation, 42–45; constitution and government, 29–30; forestry, 445; iron industry, 365; tariff, 366; wheat growing, 36; World War, 69, 88, 92.

Great Britain: relation with Australia, 185; relation with India, 162.

Irrigation: Arizona, Fig. 5, page 136; field crops, 137; Hawaii, 115; Imperial Valley, 120; Nile Basin, 22; southern Africa, 138; Oregon, 138; semi-arid regions, 214; Utah, 210; Washington, 138.

Lumber. *See* Forests.

Machinery: agricultural, 556; automobile industry, 289–293; construction, 461; for manufacturing, 602; transportation, 600.

Mineral industries: cement, 605; foreign, 611; iron furnace, 609; location, 601–603; manufacturing process, 608; pottery and porcelain, 612. *See also* Petroleum.

Oregon: canning industry, 229; climate, 335; coal mining, 362; map (Fig. 53), facing 229; national forests, area of (Fig. 78).

Peaches: 222–225, 229–230; California, 224; Chesapeake and Allegheny belt, 233; climate, effect of, 220; Europe, 225; Great Lakes, 222; Oregon, 229, 230; Ozark, 223; south temperate zone, 225.

Ranching: Argentina, 161; Australia, 163; ranges, 161–162; reindeer in Alaska, 192; South Africa, 153; Western states, 163–166. *See also* Herding.

Refrigeration: industrial uses of, 160; in homes, 216; on railways, 150.

Rubber: increase in consumption, 540–542; manufactures, 553; petroleum products in manufacture, 414; sources of, 547; synthetic, 552; world's production, 40, 411; (Fig. 262) 411.

Texas: cattle farms, 163; cotton, 148; forests, 174; oranges, 132; peaches, 139; pecans, 148; petroleum, 263; rainfall, 148; temperature, 148.

Truck farming: 126; Japanese, 88.

Wood: destruction in United States, 201; gas from, 215; hard and soft, 220; uses of, 419. *See also* Forests.

SAMPLES.

A. On what page will you find information about the climate of Oregon?
1 **78** 2 **229** 3 **335** 4 **353** 5 **362**....A

B. Can you find information about agriculture in England? 1 **Yes** 2 **No**....B

1. On what page can you find a map of Africa?
1 **90** 2 **99** 3 **119** 4 **125** 5 **130**....1

2. Does the index tell where to find information about the value of the cotton crop? 1 **Yes** 2 **No**....2

3. On what page can a definition of chemistry be found?
1 **63** 2 **66** 3 **69** 4 **70** 5 **90**....3

4. Under what topic can you find additional references to mineral industries?
1 **cement** 2 **chemistry** 3 **coal** 4 **petroleum** 5 **porcelain**....4

5. What is the number of the figure which shows something about the world's production of rubber?
1 **540** 2 **411** 3 **262** 4 **552** 5 **553**..5

6. Under what topic does the index refer to additional information about England?
1 **Africa** 2 **Australia** 3 **Canada** 4 **Egypt** 5 **Great Britain**....6

7. On what page will be found information about the effect of climate on peaches? **15**
1 **220** 2 **224** 3 **225** 4 **229** 5 **230**..7

8. What is the number of the chart showing the area of the national forests in Oregon?
1 **53** 2 **78** 3 **229** 4 **335** 5 **362**....8

9. Does the index tell on what page you can find something about lumber? 1 **Yes** 2 **No**....9

10. On what page would you learn about Japanese truck farming?
1 **63** 2 **69** 3 **70** 4 **88** 5 **126**....10

11. On how many pages is a continuous discussion given about ranching in the Western states?
1 **2** 2 **3** 3 **4** 4 **5** 5 **6**....11

12. Information about synthetic rubber is given on what page?
1 **411** 2 **540** 3 **542** 4 **552** 5 **553**..12

13. On how many different pages are brief references given to Germany's part in the World War?
1 **1** 2 **2** 3 **3** 4 **4** 5 **5**....13

14. On what page is a discussion of tropical forests given?
1 **419** 2 **421** 3 **422** 4 **426** 5 **452**....14

15. Under what other word would you look for further information about the uses of cotton?
1 **chemistry** 2 **clothing** 3 **forests** 4 **rubber** 5 **tariff**....15

NUMBER RIGHT: A	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Standard Score	111	119	127	135	143	150	155	164	169	175	181	187	193	202	208	213

Do not turn this page until you are told to do so.

TEST 2. DIRECTED READING

DIRECTIONS. A story is given below, with each sentence numbered. These numbers are to help you answer questions about the story. Read each question and find the sentence in the story which answers it. Notice the number of this sentence. Find this number among the answer spaces at the right of the question and fill in the space under it.

Look at the sample below. Space No. 1 is filled because the question in the sample is answered in sentence No. 1 in the article. Answer the other questions in a similar manner.

You will have *three minutes* for this work. You may reread parts of the story if you need to do so.

GLASS

[1] Glass is made by melting sand with lime, potash, soda, or oxide of lead at a great heat. [2] Silica, which is the basis of sand, enters into all varieties of glass. [3] It has more to do with determining the quality than any of the other ingredients. [4] The purity of the ingredients and the proportion in which they are mixed also have much to do with the quality of the glass.

[5] Sand may be said to form the basis of the glass. [6] Consequently the clearness of the glass depends largely upon the quality of this ingredient. [7] The proportion of silica varies in different kinds of glass. [8] In lead glass it is from 42 to 60 per cent; plate contains about 79 per cent, and window glass about 70 per cent. [9] The amount of silica usually determines the degree of hardness, though other substances have some effect upon this quality. [10] Lead tends to make glass soft. [11] Sometimes lime is used to make it hard.

[12] Nearly all the silica used in the glass factories within the last fifty years is in the form of sand. [13] Prior to that the best qualities of glass were produced by crushing and washing flint and quartz rock. [14] This process was so expensive that it made the glass too costly for general use. [15] Bohemian and a few other varieties of European glass are still made from silica obtained in this way. [16] The expense of Bohemian glass in this country restricts it to the homes of wealthy people.

[17] In the manufacture of glass of high grade, the quality and purity of sand are of the greatest importance. [18] The most searching examination and careful tests are made to determine the nature and extent of any impurities which the sand may contain. [19] These impurities are commonly oxide of iron (iron rust), alumina in the form of clay, loam, gravel, and decaying animal or vegetable matter. [20] Most of these impurities except iron can be removed by burning and washing. [21] Oxide of iron can be removed only by the use of chemicals. [22] Iron is the most troublesome of all because it discolors the glass and destroys its transparency. [23] For the best qualities of glass it must be entirely free from iron. [24] A proportion greater than one half of one per cent renders the sand worthless for even the poorest quality of glass.

SAMPLE. In what sentence does the article tell how glass is made? .....

1. What one substance is always present in some form in all kinds of glass? 1
2. What two factors in the manufacture of glass greatly affect its quality? 2

➔

3. What effect does the quality of sand have on glass? .3
4. Is silica used in the same amounts in different varieties of glass? 4
5. What substance used in glass making tends to make the glass less brittle? 5
6. What percentage of silica is found in plate glass? ...6
7. What one ingredient has the greatest effect on the hardness of glass? 7
8. Is lime mentioned as an ingredient which is sometimes used to affect the hardness of glass? 8
9. In what form is the silica obtained in most modern glass factories? 9
10. From what sources is the silica obtained which is used in making Bohemian glass? 10

5➔

11. What kinds of glass are still made from the silica in quartz rock? 11
12. What effect does the use of flint and quartz rock have on the cost of glass? 12
13. Are tests made for the presence of impurities in the sand that is to be used for glass? 13
14. What kind of sand is required when making the best grade of glass? 14
15. What foreign-made glass is found only in the homes of the rich? 15
16. What are the most common impurities that are found in sand? 16
17. What effect does iron have in the manufacture of glass? 17
18. What method is used in removing many of the harmful impurities from sand? 18
19. Is the science of chemistry employed in the manufacture of glass? 19
20. What per cent of iron in sand makes it useless for glass making? 20

Do not turn this page until you are told to do so.

➔

NUMBER RIGHT	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Standard Score	121	135	142	149	154	159	164	174	179	183	188	197	201	204	208	212	215	217	218	219	220

TEST 6. PARAGRAPH COMPREHENSION (*Cont'd*)

9. When a number of bees gather in one place, they are called a swarm. The size of a bee swarm varies greatly. Two of the major factors influencing the size of the swarm are the strength of the hive from which it came and the time of the year. A weak swarm may not contain more than ten thousand bees, while a strong one may have as many as eighty thousand bees.

9

A. Choose the best title for the paragraph.
1 Size of Bee Swarms 2 Size of Weak Swarms 3 Size of Strong Swarms ..... A

B. What is an important factor influencing the size of a bee swarm?
1 kind of bees 2 time of year 3 location of hive B

C. The number of bees in a swarm sometimes exceeds —
1 one hundred 2 ten thousand 3 one million C

10. From the fields the rice is taken to the mills for threshing, cleaning, husking, and polishing. Finally, the rice is graded, weighed, and packed for the market. Many mills in the United States turn out from one thousand to ten thousand bushels of rice every twenty-four hours.

10

A. Choose the best title for the paragraph. A
1 Taking Rice to the Mills 2 Polishing Rice 3 Marketing Rice .....

B. How long does it take an American rice mill to turn out one thousand bushels of rice? B
1 one week 2 one day 3 three days.....

C. Rice is taken direct to market from the —
1 mill 2 field 3 storage elevators.....C

14

11. A large portion of the lead used in the United States is in the form of metallic lead and its alloys, but the largest and most important single use of lead is in the form of white lead, for which purpose about 150,000 tons are required annually in the United States alone. White lead has been the most important paint pigment for more than two thousand years, and most of the durable exterior paints contain white lead.

11

A. Choose the best title for the paragraph.
1 Uses of White Lead 2 Making White Paint 3 Lead and Its Alloys.....A

B. How long has white lead been used as a pigment for paint?
1 since the discovery of America 2 less than 100 years 3 more than 2000 years.....B

C. The United States uses about 150,000 tons of white lead each year for the manufacture of —
1 paints 2 metallic lead 3 lead alloys.....C

12. The United States is one of the leading agricultural countries of the world. Several causes have combined to encourage this industry. Among the more important of these are the cheapness of the land, the fertility of the soil, the wide variety of climate, the energy of the people, government encouragement of scientific agriculture, and the unrivaled transportation system for marketing crops.

12

A. Choose the best title for the paragraph.
1 Transportation of Crops 2 Scientific Farming 3 Factors Favoring Farming in the United States A

B. Why is the United States one of the greatest producers of agricultural crops?
1 unlimited acres of fertile soil 2 convenience to market 3 expensive farm machinery.....B

C. The use of improved methods and machinery in all sections of the United States has been encouraged most effectively by — 1 agricultural colleges 2 manufacturers of farm machinery 3 the United States government. C

Do not turn this page until you are told to do so.

Number Right	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Standard Score	104	105	107	109	111	112	113	114	116	118	120	123	125	127	129	135	138	141	144	147	150	153	157	160	163	166	170	173	177	181	185	190	201	208	215	218	220

TEST 3. POETRY COMPREHENSION

DIRECTIONS. This is a test of your ability to read and interpret poetry. Read the poem below very carefully before attempting to answer any of the questions about it.

Notice that in this selection certain passages are marked by numbered brackets. Read each question and find the bracketed passage which contains the best answer to the question. Answer the question by filling in the answer space at the end of the question which has the same number as the bracketed passage which contains the correct answer.

You may reread parts of the poem if necessary.

The sample is answered correctly.

SAMPLE. How does the poet describe the autumn season? .....

AUTUMN

Season of mists and mellow fruitfulness,
Close bosom-friend of the maturing sun;
Conspiring with him how to load and bless
With fruit the vines that 'round the thatch-eaves run;
To bend with apples the moss'd cottage-trees,
And fill all fruit with ripeness to the core;
To swell the gourd, and plum the hazel shells
With a sweet kernel; to set budding more
And still more, later flowers for the bees,
Until they think warm days will never cease;
For Summer has o'erbrimm'd their clammy cells.
Who hath not seen Thee oft mid thy store?
Sometimes whoever seeks abroad may find
Thee sitting careless on the granary floor,
Thy hair soft-lifted by the winnowing wind,
Or on a half-reaped furrow sound asleep,
Drowsed by the fume of poppies, while thy hook
Spares the next swath and all its twined flowers;
And sometimes like a gleaner thou dost keep
Steady thy laden head across a brook;
Or by a cider-press, with patient look,
Thou watchest the last oozings, hours by hours.
Where are the songs of Spring? Ay, where are they?
Think not of them, thou hast thy music too,
While barred clouds bloom the soft-dying day,
And touch the stubble-plains with rosy hue;
Then in a wailful choir the small gnats mourn
Among the river-shallows borne aloft
Or sinking as the light wind lives or dies;
And full-grown lambs loud bleat from hilly bourn;
Hedge-crickets sing, and now with treble soft
The red-breast whistles from a garden croft
And gathering swallows twitter in the skies.

From "To Autumn," by John Keats

1. What are the sun and the season planning to do to the grapevines? 1
2. What are the attributes of this season of the year? 2
3. How does the autumn show that the harvest time is near? 3
4. How does the poet tell you that the apple trees are old and large? 4
5. For what purpose do the late flowers grow? 5
6. Does the poet think that everyone has seen the season of which he writes? 6
7. Have the bees stored up much honey? 7
8. How do the warm days of autumn confuse the bees? 8
9. Is it difficult to find the character described? 9
10. How are the gentle autumn breezes described? ... 10

6

11. What causes autumn to fall asleep in the fields? .. 11
12. Does autumn linger long at the cider-press? 12
13. Is spring worth remembering when autumn has come? 13
14. What does the sunset do to the fields from which the grain has been cut? 14
15. Is the evening sky of this season cloudless? 15
16. Are there songs of autumn as well as of spring? ... 16
17. To what sounds is the noise of the gnats along the river compared? 17
18. How are the changes in the force of the wind described? 18
19. Are young lambs found on the hills at this season? 19
20. What familiar swift flying birds are used to suggest evening? 20

Do not turn this page until you are told to do so.

Number Right	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Standard Score	115	125	135	141	152	157	163	168	177	181	184	187	191	194	197	200	203	206	209	212	215

TEST 4. WORD MEANING

DIRECTIONS. Each of the exercises in Parts A, B, C, and D of this test consists of a statement which is correctly completed by one of the five numbered words or phrases. Find the number of this correct answer. Then, in the answer space at the right of the exercise, fill in the space which has the same number as the word or phrase you selected.

The sample is answered correctly.

SAMPLE. To *toil* is to —
1 read 2 play 3 work 4 fall 5 believe .....

PART A. SOCIAL SCIENCE

1. *Tariff* means —
1 figure 2 personal expense 3 tax 4 ransom 5 quotation.....1

2. *Naturalization* means — 1 nationalism 2 nationalization 3 international
4 receiving the rights and privileges of a citizen 5 receiving immigrants.....2

3. To *inaugurate* means to —
1 imprison 2 induct into office 3 fine 4 exempt 5 incite to riot.....3

4. *Revenue* is the same as —
1 a retreat 2 an appeal 3 a revolt 4 a reunion 5 a collection of funds for public use..4

5. A *democracy* is a government of the —
1 few 2 people 3 many 4 rich 5 nobility.....5

6. To *veto* is to —
1 denounce 2 enact 3 resign 4 refuse 5 accuse.....6

7. To *filibuster* is the same as to —
1 vote 2 lobby 3 make a law 4 encourage legislation 5 delay legislation.....7

8. A *franchise* is a — 1 grant of a constitutional right 2 candid opinion 3 political office
4 requirement for public office 5 bill for raising revenue.....8

9. *Legislation* means —
1 passing laws 2 lawfulness 3 legality 4 diplomacy 5 law enforcement.....9

7

10. *Conservation* means — 1 consumption of goods 2 careful sanitation 3 preservation of goods
4 deforestation 5 shipment of supplies 10

11. *Ratification* means —
1 appraisal 2 taxation 3 treason 4 majority 5 public sanction.....11

12. To *confiscate* is to —
1 tear down 2 build up 3 seize by public authority 4 support 5 use for public building 12

13. *Indemnity* means —
1 insurance 2 pension 3 compensation for loss 4 indenture 5 indebtedness.....13

14. *Despotism* means —
1 tyranny 2 despair 3 danger 4 benevolence 5 representative government.....14

15. *Sedition* means —
1 passion 2 treason 3 confidence 4 certainty 5 secret.....15

16. An *emigrant* is — 1 a barbarian 2 a stranger 3 a new recruit
4 one who leaves a country 5 one who enters a country 16

17. *Sanitation* refers to —
1 health 2 disease 3 Red Cross 4 disaster 5 hygiene.....17

18. *Jurisdiction* means —
1 vindication 2 legality 3 administration of law 4 sphere of authority 5 judicial decision...18

19. *Embassy* means the same as —
1 ambassador 2 merchant marine 3 embargo 4 vice governor 5 vassal.....19

20. A *statute* means —
1 statuary 2 a legislative act 3 a by-law 4 a legal procedure 5 the height of a man 20

Go right on to the next page.

Number right, Part A.....

TEST 6. PARAGRAPH COMPREHENSION (*Cont'd*)

5. One of the most pressing economic problems of today is the securing of an adequate food supply. In the more densely populated parts of Asia an unfavorable growing season has for centuries meant famine and death for thousands of persons. The fact that the population of the earth is increasing far more rapidly than the food supply should give us an increased interest in plants, the primary source of all foods. When we realize further that our resources of lumber, fuel, fibers, paper pulp, oils, resin, rubber, and numerous other products come from plants, our absolute dependence on plant life is apparent.

5

A. Choose the best title for the paragraph. A
1 Natural Resources 2 Decreasing Food Supply 3 Importance of Plant Life .....

B. Why is the matter of an adequate food supply such an important economic problem? 1 increase in population exceeds growth in food supply 2 decrease in natural resources 3 wars and famines..... B

C. The primary source from which all food for man comes is — 1 farms 2 animal life 3 plant life... C

---

6. Endurance on the wing is much more remarkable than the speed with which birds fly. Many birds seem to be continually in the air. During migrations a large variety undertake long journeys, which sometimes reach halfway around the world.

6

A. Choose the best title for the paragraph. ➡
1 Flight of Birds 2 Endurance of Birds 3 Migration of Birds..... A

B. What makes it possible for birds to make such long and rapid migrations? 1 birds fly at great height 2 birds have unusual endurance in flight 3 birds fly at great speed..... B

C. Birds often go on migratory journeys which —
1 take them from one hemisphere to another 2 keep them in the air for twenty-four hours 3 take them completely around the globe..... C

13➡

---

7. Charles W. Eliot, formerly head of Harvard University, exercised an influence far beyond that of the usual college president. He was looked up to by hundreds of thousands of his fellow citizens as a guide, not merely in educational matters but in all of the great political, industrial, social, and moral questions. It is difficult to name another figure who so largely dominated our intellectual horizon.

7

A. Choose the best title for the paragraph.
1 Influence of Eliot 2 People's Admiration of Eliot 3 Scholarship of Eliot..... A

B. Why was Charles W. Eliot so much admired by those who knew him?
1 he gave financial aid 2 he helped them secure employment 3 he gave sound and helpful advice B

C. Eliot became famous chiefly because of —
1 his position 2 his service to his fellow men 3 his writings..... C

➡

---

8. The Red Cross is an international agency which was organized primarily to care for the sick, the wounded, and prisoners in times of war. Recently it has shown a tendency to regard the alleviation of human suffering, whatever its source, as falling under its jurisdiction. The fundamental idea for the movement came as the result of the publication of a booklet by Henri Dunant in 1862.

8

A. Choose the best title for the paragraph.
1 Organization of the Red Cross 2 Purposes of the Red Cross 3 Founder of the Red Cross... A

B. What type of organization is the Red Cross?
1 international 2 national 3 local..... B

C. At the present time the Red Cross expends its efforts in — 1 caring for the injured in war areas 2 caring for only the poor 3 relieving human suffering anywhere..... C

Go right on to the next page.

TEST 3. POETRY COMPREHENSION

DIRECTIONS. This is a test of your ability to read and interpret poetry. Read the poem below very carefully before attempting to answer any of the questions about it.

Notice that in this selection certain passages are marked by numbered brackets. Read each question and find the bracketed passage which contains the best answer to the question. Answer the question by filling in the answer space at the end of the question which has the same number as the bracketed passage which contains the correct answer.

You may reread parts of the poem if necessary.

The sample is answered correctly.

SAMPLE. How does the poet describe the autumn season? .....

AUTUMN

Season of mists and mellow fruitfulness,
Close bosom-friend of the maturing sun;
Conspiring with him how to load and bless
With fruit the vines that 'round the thatch-eaves run;
To bend with apples the moss'd cottage-trees,
And fill all fruit with ripeness to the core;
To swell the gourd, and plum the hazel shells
With a sweet kernel; to set budding more
And still more, later flowers for the bees,
Until they think warm days will never cease;
For Summer has o'erbrimm'd their clammy cells.
Who hath not seen Thee oft mid thy store?
Sometimes whoever seeks abroad may find
Thee sitting careless on the granary floor,
Thy hair soft-lifted by the winnowing wind,
Or on a half-reaped furrow sound asleep,
Drowsed by the fume of poppies, while thy hook
Spares the next swath and all its twined flowers;
And sometimes like a gleaner thou dost keep
Steady thy laden head across a brook;
Or by a cider-press, with patient look,
Thou watchest the last oozings, hours by hours.
Where are the songs of Spring? Ay, where are they?
Think not of them, thou hast thy music too,
While barred clouds bloom the soft-dying day,
And touch the stubble-plains with rosy hue;
Then in a wailful choir the small gnats mourn
Among the river-shallows borne aloft
Or sinking as the light wind lives or dies;
And full-grown lambs loud bleat from hilly bourn;
Hedge-crickets sing, and now with treble soft
The red-breast whistles from a garden croft
And gathering swallows twitter in the skies.

From "To Autumn," by John Keats

1. What are the sun and the season planning to do to the grapevines? 1
2. What are the attributes of this season of the year? 2
3. How does the autumn show that the harvest time is near? 3
4. How does the poet tell you that the apple trees are old and large? 4
5. For what purpose do the late flowers grow? 5
6. Does the poet think that everyone has seen the season of which he writes? 6
7. Have the bees stored up much honey? 7
8. How do the warm days of autumn confuse the bees? 8
9. Is it difficult to find the character described? 9
10. How are the gentle autumn breezes described? ... 10

6➡

11. What causes autumn to fall asleep in the fields? .. 11
12. Does autumn linger long at the cider-press? 12
13. Is spring worth remembering when autumn has come? 13
14. What does the sunset do to the fields from which the grain has been cut? 14
15. Is the evening sky of this season cloudless? 15
16. Are there songs of autumn as well as of spring? ... 16
17. To what sounds is the noise of the gnats along the river compared? 17
18. How are the changes in the force of the wind described? 18

➡

19. Are young lambs found on the hills at this season? 19
20. What familiar swift flying birds are used to suggest evening? 20

Do not turn this page until you are told to do so.

NUMBER RIGHT	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Standard Score	115	125	135	141	152	157	163	168	177	181	184	187	191	194	197	200	203	206	209	212	215

TEST 6. PARAGRAPH COMPREHENSION (*Cont'd*)

5. One of the most pressing economic problems of today is the securing of an adequate food supply. In the more densely populated parts of Asia an unfavorable growing season has for centuries meant famine and death for thousands of persons. The fact that the population of the earth is increasing far more rapidly than the food supply should give us an increased interest in plants, the primary source of all foods. When we realize further that our resources of lumber, fuel, fibers, paper pulp, oils, resin, rubber, and numerous other products come from plants, our absolute dependence on plant life is apparent.

5

A. Choose the best title for the paragraph. A
1 Natural Resources 2 Decreasing Food Supply 3 Importance of Plant Life .....

B. Why is the matter of an adequate food supply such an important economic problem? 1 increase in population exceeds growth in food supply 2 decrease in natural resources 3 wars and famines..... B

C. The primary source from which all food for man comes is — 1 farms 2 animal life 3 plant life... C

---

6. Endurance on the wing is much more remarkable than the speed with which birds fly. Many birds seem to be continually in the air. During migrations a large variety undertake long journeys, which sometimes reach halfway around the world.

6

A. Choose the best title for the paragraph. ➡
1 Flight of Birds 2 Endurance of Birds 3 Migration of Birds..... A

B. What makes it possible for birds to make such long and rapid migrations? 1 birds fly at great height 2 birds have unusual endurance in flight 3 birds fly at great speed..... B

C. Birds often go on migratory journeys which —
1 take them from one hemisphere to another 2 keep them in the air for twenty-four hours 3 take them completely around the globe..... C

13➡

7. Charles W. Eliot, formerly head of Harvard University, exercised an influence far beyond that of the usual college president. He was looked up to by hundreds of thousands of his fellow citizens as a guide, not merely in educational matters but in all of the great political, industrial, social, and moral questions. It is difficult to name another figure who so largely dominated our intellectual horizon.

7

A. Choose the best title for the paragraph.
1 Influence of Eliot 2 People's Admiration of Eliot 3 Scholarship of Eliot..... A

B. Why was Charles W. Eliot so much admired by those who knew him?
1 he gave financial aid 2 he helped them secure employment 3 he gave sound and helpful advice B

C. Eliot became famous chiefly because of —
1 his position 2 his service to his fellow men 3 his writings..... C

➡

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8. The Red Cross is an international agency which was organized primarily to care for the sick, the wounded, and prisoners in times of war. Recently it has shown a tendency to regard the alleviation of human suffering, whatever its source, as falling under its jurisdiction. The fundamental idea for the movement came as the result of the publication of a booklet by Henri Dunant in 1862.

8

A. Choose the best title for the paragraph.
1 Organization of the Red Cross 2 Purposes of the Red Cross 3 Founder of the Red Cross... A

B. What type of organization is the Red Cross?
1 international 2 national 3 local..... B

C. At the present time the Red Cross expends its efforts in — 1 caring for the injured in war areas 2 caring for only the poor 3 relieving human suffering anywhere..... C

Go right on to the next page.

TEST 4. WORD MEANING

DIRECTIONS. Each of the exercises in Parts A, B, C, and D of this test consists of a statement which is correctly completed by one of the five numbered words or phrases. Find the number of this correct answer. Then, in the answer space at the right of the exercise, fill in the space which has the same number as the word or phrase you selected.
The sample is answered correctly.

SAMPLE. To *toil* is to —
1 read 2 play 3 work 4 fall 5 believe .....

PART A. SOCIAL SCIENCE

1. *Tariff* means —
1 figure 2 personal expense 3 tax 4 ransom 5 quotation.....1
2. *Naturalization* means — 1 nationalism 2 nationalization 3 international
4 receiving the rights and privileges of a citizen 5 receiving immigrants.....2
3. To *inaugurate* means to —
1 imprison 2 induct into office 3 fine 4 exempt 5 incite to riot.....3
4. *Revenue* is the same as —
1 a retreat 2 an appeal 3 a revolt 4 a reunion 5 a collection of funds for public use..4
5. A *democracy* is a government of the —
1 few 2 people 3 many 4 rich 5 nobility.....5
6. To *veto* is to —
1 denounce 2 enact 3 resign 4 refuse 5 accuse.....6
7. To *filibuster* is the same as to —
1 vote 2 lobby 3 make a law 4 encourage legislation 5 delay legislation.....7
8. A *franchise* is a — 1 grant of a constitutional right 2 candid opinion 3 political office
4 requirement for public office 5 bill for raising revenue.....8
9. *Legislation* means —
1 passing laws 2 lawfulness 3 legality 4 diplomacy 5 law enforcement.....9

7

10. *Conservation* means — 1 consumption of goods 2 careful sanitation 3 preservation of goods
4 deforestation 5 shipment of supplies 10
11. *Ratification* means —
1 appraisal 2 taxation 3 treason 4 majority 5 public sanction.....11
12. To *confiscate* is to —
1 tear down 2 build up 3 seize by public authority 4 support 5 use for public building 12
13. *Indemnity* means —
1 insurance 2 pension 3 compensation for loss 4 indenture 5 indebtedness.....13
14. *Despotism* means —
1 tyranny 2 despair 3 danger 4 benevolence 5 representative government.....14
15. *Sedition* means —
1 passion 2 treason 3 confidence 4 certainty 5 secret.....15
16. An *emigrant* is — 1 a barbarian 2 a stranger 3 a new recruit
4 one who leaves a country 5 one who enters a country 16
17. *Sanitation* refers to —
1 health 2 disease 3 Red Cross 4 disaster 5 hygiene.....17
18. *Jurisdiction* means —
1 vindication 2 legality 3 administration of law 4 sphere of authority 5 judicial decision...18
19. *Embassy* means the same as —
1 ambassador 2 merchant marine 3 embargo 4 vice governor 5 vassal.....19
20. A *statute* means —
1 statuary 2 a legislative act 3 a by-law 4 a legal procedure 5 the height of a man 20

Go right on to the next page.

Number right, Part A.....

TEST 6. PARAGRAPH COMPREHENSION

DIRECTIONS. Read each paragraph carefully, and then study the questions *A*, *B*, and *C* at the right. Select the correct answer. Notice the number of this answer. In the margin at the right, fill in the answer space under this number.

1. Before the match was invented, starting a fire was not an easy matter. The Indians often started fires by rubbing two sticks together. A much more common method among the early settlers was to strike steel and flint together, the sparks lighting a bit of "tinder." Oftentimes live coals were carried from one house to another. Since the invention of the friction match in 1827, starting a fire has become a simple process.

1

A. Choose the best title for the paragraph.
1 Invention of Matches 2 Methods of Starting Fires 3 How Indians Started Fires.....A

B. In case a pioneer was forced to build a fire while in camp, what did he use to start it? 1 flint and steel 2 matches 3 coals from another fire.....B

C. Indians often started fires by —
1 striking two rocks together 2 rubbing two sticks together 3 carrying burning tinder with them C

2. Rubber is one of the important products of the world today. The annual supply is nearly 300,000 tons, two thirds of which is used in the United States, principally for automobile tires. Rubber is also used in making medical supplies, household articles, batteries, toys, and clothing; and recently a rubber bearing has been successfully used on parts moving in water.

2

A. Choose the best title for the paragraph.
1 Use of Rubber for Tires 2 Annual Supply of Rubber 3 Importance of Rubber.....A

B. What proportion of the world's annual production of rubber is used in the United States?
1 one half 2 one third 3 two thirds.....B

12

C. The principal use of rubber in the United States is in the manufacture of — 1 automobile accessories 2 clothing 3 household appliances.....C

3. The Mayas were a race of Indians inhabiting the peninsula of Yucatan. They were much more civilized than other tribes of American Indians. When they were first found by the white men, they gave evidence of possessing many skills and abilities which were similar to those displayed by the whites. They constructed houses of faced concrete, four and five stories high. The Mayas were expert potters and have left many beautiful products of their skill. Their history, religion, rites, and magic were recorded in their books in hieroglyphic characters.

3

A. Choose the best title for the paragraph.
1 Mayan Architecture 2 Civilization of the Mayas 3 American Indians.....A

B. What special evidence of advanced civilization did the Mayas leave? 1 use of hieroglyphics 2 domesticated animals 3 modern building construction B

C. The Mayas, a highly civilized race of Indians, formerly lived in —
1 Mexico 2 Yucatan 3 Peru.....C

4. All animals sleep, but many of them do so in ways so curious that they seem to be awake. Ducks sleep on open water, and to keep from drifting ashore paddle with one foot continually, thus traveling in a circle. Bats sleep head downward, hanging by their hind claws. Many animals of the cat species sleep with wide-open staring eyes. Elephants sleep standing up, their heads slowly swinging as if they were awake. Stories that some animals do not sleep are the result of these and other curious examples.

4

A. Choose the best title for the paragraph.
1 How Animals Sleep 2 Why Animals Sleep 3 Animal Life.....A

B. What animals sleep with their eyes open? 1 elephants 2 some species of cats 3 all ducks.....B

C. Ducks, when sleeping on the water, —
1 sit perfectly still 2 drift toward shore 3 paddle in a circle.....C

Go right on to the next page.

1. *Preservation* means — 1 assumption 2 keeping from decay 3 rapid development 4 continued activity 5 phenomenon 1
2. To *function* means to — 1 filter 2 condense 3 operate 4 be in the intended place 5 diffuse 2
3. *Energy* means — 1 kinetic 2 endurance 3 potential 4 power to act 5 compulsion 3
4. *Science* means — 1 systematized knowledge 2 theory 3 scientific 4 general law 5 a scientist 4
5. *Saturated* means — 1 completely filled 2 satisfied 3 dried 4 expanded 5 developed 5
6. *Evolution* is the process of — 1 alternating 2 deviating 3 forming 4 developing 5 drilling 6
7. *Neutralize* means — 1 oppose 2 mix 3 destroy 4 counteract 5 adhere 7
8. *Efficiency* means — 1 effort 2 friction 3 diffusion 4 power to act 5 effectual power 8
9. *Decomposition* is a process of — 1 osmosis 2 decay 3 corrosion 4 crystallization 5 neutralization 9
10. To *experiment* means to — 1 practice 2 distribute 3 expand 4 criticize 5 reproduce phenomena under control 10
11. *Aqueous* means — 1 solid 2 metallic 3 liquid 4 acid 5 gaseous 11
12. *Buoyancy* means — 1 lifelike 2 motionless 3 upward pressure 4 force of water 5 deflection 12
13. *Inertia* means — 1 ineptitude 2 resistance to change 3 capability 4 inefficiency 5 intensity 13
14. *Volatile* means — 1 easily evaporated 2 viscous 3 quickly frozen 4 opaque 5 flexible 14
15. *Synthesis* is the same as — 1 analyzing 2 taking apart 3 summarizing 4 building up 5 experimenting 15

PART C. MATHEMATICS

8

1. To *transpose* means to — 1 examine 2 check 3 exchange in position 4 drill 5 reason 1
2. *Balance* means — 1 breadth 2 equality between two values 3 a weight 4 opposite 5 steadfastness 2
3. *Solution* means — 1 addition 2 grouping 3 securing the answer 4 definition 5 explanation 3
4. *Equivalent* means — 1 interest 2 abstract 3 checking computations 4 combination 5 same in value 4
5. *Vertical* means the same as — 1 a point 2 a vertex 3 a given length 4 perpendicular to the plane of the horizon 5 numerical values 5
6. An *inventory* is — 1 a ratio 2 a detailed account 3 a factor 4 a result 5 an explanation 6
7. *Consequent* means — 1 resulting 2 counting 3 checking 4 following 5 changing 7
8. *Corresponding* means — 1 writing 2 reciprocal 3 correct 4 same in quantity or quality or position 5 precise 8
9. *Equilateral* means — 1 equality 2 equal distances 3 equivalent 4 diagonal 5 equal sides 9
10. To *compute* is to — 1 compel 2 commence 3 copy 4 calculate 5 count 10
11. To *verify* means to — 1 prove 2 doubt 3 construct 4 study 5 work 11
12. *Magnitude* refers to — 1 multiplication 2 estimation 3 size 4 the middle 5 the median 12
13. *Infinite* means — 1 definite 2 resulting 3 consequent 4 intersecting 5 limitless 13
14. To *circumscribe* means to — 1 use a compass 2 draw around 3 draw through 4 complete 5 find a circumference 14
15. *Axiom* means a — 1 self-evident truth 2 proved law 3 whole number 4 straight line 5 faulty principle 15

Go right on to the next page.

Number right, Part B ..... *Number right, Part C* .....

TEST 5. SENTENCE MEANING (*Cont'd*)

26. Will a slight discrepancy necessarily remain obscured?.....26

27. Are true statements usually inconsistent?.....27

28. Do satisfactory solutions of problems ever follow controversies?.....28

29. Does an untried thing frequently have value?.....29

30. Are most people apprehensive before entering upon an unusual ordeal?.....30

31. Is a reversal of a judicial decision impossible?.....31

32. Is one's conduct usually influenced by one's moral convictions?.....32

33. Is aggressive behavior unusual in a contest?.....33

34. Are excessive activities characteristic of a temperate person?.....34

35. Is it unethical to circulate slanderous rumor?.....35

36. Is petty misbehavior conducive to the formation of a desirable reputation?.....36

37. Is efficient service always insured by adequate remuneration?.....37

38. Does fresh air inhibit the action of bacteria that cause tuberculosis?.....38

11

39. Are identical objects necessarily similar in appearance?.....39

40. Should a nation consider valuable natural resources as an asset?.....40

41. Are critical people necessarily industrious?.....41

42. Does the watchfulness of law-enforcement officers help to insure traffic safety?.....42

43. Does a perennial plant survive from season to season?.....43

44. Is a knowledge of the details of the genuine note a protection against counterfeit bills?.....44

45. Should a strict program of economy involve excessive expenditures?.....45

46. Has the development of the automotive industries seriously reduced pedestrianism?.....46

47. Do caustic remarks usually promote congeniality?.....47

48. Is an impassioned speech usually delivered slowly and deliberately?.....48

49. Is education generally considered detrimental to human welfare?.....49

50. Is an epicure a connoisseur of delicate viands?.....50

Do not turn this page until you are told to do so. *No. Right.....* *No. Wrong.....* *Right minus Wrong.....*

Right minus Wrong	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Standard Score	121	126	130	133	135	137	140	142	145	147	150	151	153	154	156	158	160	162	164	165	167	169	171	173	175	177	179	182	184	186	189	190	193

Right minus Wrong	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Standard Score	193	196	198	199	201	203	206	209	211	212	214	217	220	223	226	229	234	240

TEST 4 (*Cont'd*). PART D. ENGLISH

A *biography* is —
1 an anthology 2 a fable 3 a written life of a person 4 a tradition 5 a tract.....1

A *myth* is —
1 a primitive imaginary tale 2 a mystery play 3 an epigram 4 a burlesque 5 a comedy..2

A *salutation* is —
1 a letter 2 a poem 3 an outline 4 a greeting 5 an expression.....3

Synonyms are — 1 terse words 2 words similar in meaning 3 vulgarisms
4 vague words 5 words opposite in meaning.....4

A *metaphor* is —
1 a refrain 2 a figure of speech 3 an allegory 4 a couplet 5 an epistle.....5

Tense pertains to —
1 mode 2 prepositions 3 verbs 4 nouns 5 adverbs.....6

Fictitious means —
1 imaginative 2 genuine 3 decadent 4 skeptical 5 secular.....7

Melancholy means —
1 mawkish 2 ludicrous 3 sentimental 4 gloomy 5 gruesome.....8

Characterization means —
1 fascination 2 representation 3 dramatization 4 dialect 5 chivalry.....9

Unity is obtained by using — 1 loose sentences 2 specific terms 3 dangling participles
4 related material 5 many modifiers.....10

An *anecdote* is —
1 a parable 2 an altruism 3 an allegory 4 an allusion 5 an account of an incident.....11

Ambiguous means —
1 unorganized 2 literary 3 clearly understood 4 eloquent 5 of doubtful meaning..12

Coördinate means —
1 emphatic 2 coherent 3 equal in rank 4 correlative 5 connected.....13

Impromptu means about the same as —
1 offhand 2 specific 3 improving 4 indefinite 5 imperative.....14

9

To be *coherent* is to be —
1 inconsistent 2 systematic 3 composed 4 logically clear 5 vague.....15

An *elegy* is —
1 a diary 2 a poem of lamentation 3 an ode 4 an epitaph 5 an oration.....16

A *sonnet* is a —
1 ditty 2 stanza 3 14-line poem 4 classic 5 rune.....17

A *bard* is a —
1 novelist 2 mystic 3 nonconformist 4 poet 5 pagan chieftain.....18

Analogy means —
1 term 2 hypothesis 3 fallacy 4 similarity 5 enigma.....19

Hackneyed means —
1 archaic 2 unusual 3 illiterate 4 stilted 5 commonplace.....20

Do not turn this page until you are told to do so.

Number right, Part D.....

Right: A + B + C + D	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ndard Score	95	98	101	103	108	111	113	116	119	121	122	124	127	132	134	137	139	142	144	148	150	152	154	156	158	160	162	164	166	168	169	171

Right: A + B + C + D	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
ndard Score	173	174	176	178	180	181	183	185	187	188	190	192	193	195	196	197	198	200	202	203	205	207	208	210	212	213	215	217	218	219	221	222

Right: A + B + C + D	64	65	66	67	68	69	70
ndard Score	224	225	227	229	231	233	235

TEST 5. SENTENCE MEANING

DIRECTIONS. You are to read each sentence and answer it by filling in the answer space under the right answer. Study the samples. Do not guess.

SAMPLES. *A*. Are all people dishonest? ..... A

B. Are authors often quoted? ..... B

1. Sho[illegible]n all people? 1
2. Is harmony between nations encouraged by the League of Nations? 2
3. Is dependable evidence always available? 3
4. Is it wise to misapply talent? 4
5. Do nations always react favorably to plans for reduction of arms? 5
6. Does success usually depend on one's perseverance? 6
7. Are agility and endurance considered undesirable in an athlete? 7
8. Is an approximation a precise answer? 8
9. Are authorities sometimes quoted in editorials? 9
10. Are those who are most boastful ever the least important? 10
11. Does allegiance to one's country imply loyalty? 11

10→

12. Are all festivities characterized by formality and ceremony? 12
13. Do most occupations involve some work that is not pleasant? 13
14. Do exact instruments facilitate accurate measurements? 14
15. Should very important work be done only by able men? 15
16. Is disagreement among the members of Parliament unusual? 16
17. Is it true that all future events are definitely predictable? 17
18. Do frequent changes in plans always result in failure? 18
19. Must exercise be violent to be considered adequate? 19
20. May disputes ever arise over an expedient alliance? 20
21. Is the presence of an obnoxious guest displeasing to the host? 21
22. Does antagonism to the law indicate that one is patriotic? 22
23. Will a precarious position be improved by a lack of care? 23
24. Are desirable laws often hard to enforce? 24
25. Is flattery always an expression of admiration? 25

Go right on to the next page. →

NO_____

DATE_____

NAME_____

AGE_____

GRADE_____

SEX_____

FIX._____

REG._____

SPAN_____

DUR._____

RATE_____

COMP._____

CARD LVL.

TEST:

_____YRS. _____MO.

Averages for Measurable Components of the Fundamental Reading Skills

		1st	2nd	3rd	4th	5th	6th	JrH	HS	Col.
Fixations (including regressions) per 100 words	____									
Regressions per 100 words	____									
Average Span of Recognition (in words)	____									
Average Duration of Fixations (in seconds)	____									
Rate of Comprehension (in words per minute)	____									

A. Comprehension Score _____%

B. Grade Level of Fundamental Reading Skill____

C. Grade Level of Test Selection _____

Other Remarks: